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INFLUENCE OF CLOUD COMPUTING APPLICATION IN ACADEMIC LIBRARIES

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ABSTRACT

Cloud computing is web based technology which is not a new technology but it is a new form of computing. It is a type of computing technology which facilitates in sharing resources and services over the internet rather the having these and resources on local servers/nodes or personal devices. Cloud computing brings the revolutionary changes in the world of Information Communication Technology because of its potential profits such as reduced cost, accessible anywhere anytime as well as its elasticity and flexibility. The present paper explores the key questions related to the cloud computing, definitions, characteristics, models and application of new generation libraries and advantages as well as disadvantages of the cloud computing in Libraries.

KEYWORDS: Academic Libraries, Cloud computing, Open source, Services, Storage.

1. INTRODUCTION

Cloud Computing is an INTERNET based computing that provides shared computer processing resources and data in computers and other devices on demand. The resource sharing particularly for computer networks, servers, storage, applications and services. Cloud computing is based on internet media. Using internet technology many servers shares resources for the use of software applications, different resources including information, networking computer and devices which are attached on request with the control of electricity grid. The Service providers using clouds requirements to pay for their resources and services rendered used in cloud computing environment. Cloud computing is web based technology which is not a new technology but it is a new form of computing. It is a type of computing technology which facilitates in sharing resources and services over the internet rather the having these and resources on local servers/nodes or personal devices.

In library science, the use of cloud computing for different purposes and for achieving economy in library functions. Cloud computing is a new technique and core area the professionals should be aware of it and also the application of cloud computing in library science. Cloud computing is define as an emerging computer paradigm where data and services reside in massively scalable data centres in the cloud and can be accessed from any connected devices over the internet. Cloud computing is provides different services on virtual machines allocated on top of a large physical machine pool which resides in the cloud. Cloud

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computing focus only when we think about IT has always wanted a way to increase capacity or add different capabilities to the current setting on the fly without investing in new infrastructure, training new but cloud computing offers a better solution we have lots of compute power and storage capabilities residing in the distributed environment of the cloud. Based on the computing needs of the client, the infrastructure allotted to the client can be scaled up or down. From a business point of view, cloud computing is a method to address the Scalability and availability concerns for large scale applications which involves lesser Overhead. Since the resource allocated to the client can be varied based on the needs of the client and can be done without any fuss, the overhead is very low.

2. 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.

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SLA Driven

Usually businesses have agreements on the amount of services. Scalability and availability issues cause clients to break these agreements. But cloud computing services are SLA driven such that when the system experiences peaks of load, it will automatically adjust itself so as to comply with the service-level agreements. The services will create additional instances of the applications on more servers so that the load can be easily managed.

Virtualized

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

Flexible

Another feature of the cloud computing services is that they are flexible. They can be used to serve a large variety of workload types - varying from small loads of a small consumer application to very heavy loads of a commercial application.

3. TYPES OF CLOUD COMPUTING

Software as a service (SaaS)

Software package such as CRM or CAD/CAM can be accessed under cloud computing. Here customer registration is allowed to use software accessible through net and use it for his or his business process. The related data and work may be stored on local machines or with the service providers. SaaS services may be available on rental basis or on per use basis.

Platform as a Service (PaaS)

Cloud vendors are companies that offer cloud computing services and products. One of the services that they provide is called PaaS. Under this a computing platform such as operating system is provided to a customer or end user on a monthly rental basis. Some of the major cloud computing vendor is Amazon, Microsoft, and Google etc.

Infrastructure as a service (IaaS)

The cloud computing vendors offer infrastructure as a service. One may avail hardware services such as processors, memory, networks etc on agreed basis for specific duration and price.

4. TYPES OF CLOUD STORAGE

Public cloud storage

Data is stored in data center maintained by a separate service provider outside the enterprise in public cloud storage. In public cloud storage the enterprises backup their data and gets

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freedom from maintaining hardware and software resources needed for storage of data. Live data generated by applications running on an enterprise‟s premises can also be stored in public cloud storage.

Personal cloud storage

Data of an individual is stored in the cloud and this data can be accessed from anywhere in personal cloud storage. It is subset of public cloud storage. It is also called mobile cloud storage as in this type of cloud storage the stored data is synchronized and shared across multiple devices like tablet computers and mobile phones.

Hybrid cloud storage

Hybrid cloud storage is a combination of public and private cloud storage, In this storage the critical data is stored in the enterprise's private cloud while other data is stored a public cloud storage provider.

5. ADVANTAGES OF CLOUD COMPUTING IN LIBRARIES

There are various profits of Cloud Computing in libraries are as follows:

Flexibility and Innovation

The user has great flexibility to obtain the services from which type of clouds and it is itself an innovation. Flexibility helps to improve the Library services.

Cost saving

By using Cloud Computing in Libraries, lot of cost saves in the libraries. Saved cost can be used for other purposes of the Library.

User Centric

It has been observed that cloud computing is generally a user centric. Library users are always at centric position while providing library services to the users. In this context cloud computing is helpful.

Openness

Such type of Cloud Computing is open that any library can participate. This concept of openness will further improve the Library services.

Transparency

Transparency for participating Libraries in Cloud computing.

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Availability any time any where

Generally due to cloud computing services can be reached at anywhere and also for 7X24. This is the major benefit in the context of library services.

Create and Collaborate

In Cloud Computing participating libraries can create their own services and simultaneously collaborate in participating environment.

6. DISADVANTAGES OF CLOUD COMPUTING

Dependency on INTERNET

Cloud computing is dependency on INTERNET. The INTERNET services are running smoothly then cloud computing services is running smoothly while if any problem in internet, cloud computing services stands to be closed.

Downtime

No Cloud provider, even the very best, would claim immunity to service outages.

Security and Privacy

There is no security and privacy of the data, especially when it comes to sensitive data.

Vulnerability to attack

Every component is potentially accessible from the INTERNET in the Cloud computing environment. There are various chances of vulnerability of attack at anywhere in the internet environment.

Limited Control and flexibility

In the cloud computer environment, there is limited control flexibility by service seekers. This environment will create monopoly of service providers.

Cloud computing costs

Cloud computing especially on a small scale and for short term projects can be a costly. The overall the price tags may be higher as expected.

7. APPLICATIONS OF CLOUD COMPUTING IN LIBRARIES

There are various areas of libraries where cloud computing services can be applied as under:

Building Digital Libraries/ Institutional Repositories

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It has been observed that the participating Libraries in Cloud computing can easily build Digital libraries/ institutional repositories by using software like D Space, etc.

Searching Library data

Searching library data is very important service by which participating libraries can search the data from anywhere and at any time. OCLC World Cat service for searching data which is available on clouds.

Hosting websites

In the present scenario, Libraries preferred to hosting their own websites on third party service providers rather than maintaining their own servers.

Searching Scholarly Contents

In the present scenario, the user in Libraries usually searches their scholarly contents in cloud based services. For instance UGC Digital Library consortium of INFLIBNET is the best example.

File Storage

By using cloud computing libraries can store number of useful files and these files can be shared at anytime and anywhere.

Library Automation

Generally Application softwares required for Library automation are costlier and moreover servers required for library automation are also costlier. In cloud based computing there is no need to purchase application softwares, servers, etc.

Building community Power

By using social networking sites like facebook and twitter etc, library professionals can build networks of professionals working in different kinds of libraries. Moreover network can also build of information seekers.

8. CONCLUSION:

Cloud computing builds on decades of research in visualization, distributed computing, utility computing, more recently networking and web software services. It implies a service oriented architecture, reduced information technology overhead for the end user, great flexibility, reduced total cost of ownership, on demand services and many other things. The cooperative effect of libraries using 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 exchanging the both library users experience and library staff workflows. Cloud computing is not a new technology but a new form of computing.

Libraries are on the path to apply cloud based applications in order to enhance their services very effectively and efficiently.

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