

Key Issues And Challenges In Cloud Computing For Library Services

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ABSTRACT

Cloud computing can help libraries collaborate with each other in a facile manner. Every library has its own electronic data resources. If all electronic data resources are put together in a single place which may be accessed by a group of libraries, the whole electronic data base will become huge. This space which contains all the electronic data can be some cloud, say, a library cloud. This library cloud will contain the digitized data of different libraries and hence, will help libraries integrate their data. The need for maintaining and backing up the data will not be the responsibility of the libraries since all the data will be stored in the cloud which shall be managed by some cloud provider. It will also help the libraries in scaling up or down their data capacity whenever required. This scaling up or down is purely a function of need. Hence, the libraries would be consuming exactly the required space. As a result, libraries will not have to predict their future needs and buy space and infrastructure beforehand. This co adjuvant effort of the libraries will not only increase the overall efficiency (since the data will be shared) but also open doors for innovation, make libraries a lot more Scalable and help save money as well. This model would let libraries maintain more control over the applications and data stores that contain sensitive, private information about patrons. Provisioning and maintenance of infrastructure for Web based digital library present several challenges. In this paper we discuss about how library services can be utilized effectively using Cloud Computing and also discussed about , Issues, Challenges and benefits of cloud computing.

Keywords: Cloud Computing, Digital Library, Library Services through Cloud Computing.

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I. INTRODUCTION

Cloud computing is a new computing paradigm, involving data and/or computation outsourcing, with Infinite and elastic resource scalability, On demand just-in-time provisioning, No upfront cost pay-as-you-go. According to the definition given by NIST (National Institute of Standards and Technology), Cloud Computing is the improvement of Distributed Computing, Parallel Computing, Grid Computing² and Distributed Databases. In other words, by collecting large quantities of information and resources stored in personal computers, mobile phones and other equipment, Cloud Computing is capable of integrating them and putting them on the public cloud for serving users. Digital library is a development-oriented hardware and software integration platform, through to technical and the product integration, each kind of carrier digitization, carries on the effective deposit and the organization, provides the network the effective service. After Digital library technology popularization, provided the high grade information service but simultaneously also to expose all sorts of

questions unceasingly, because the zones of different the current economic condition limit presented the development



Figure1. Cloud Computing

II. TYPES OF CLOUD

Basically there are three types of cloud services:

1. **Software as a Service (SaaS):** Applications or software is delivered as a service to the customer

who can access programs from any device connected online. Some of these Web-based applications are free such as Hotmail, Google Apps, Skype, and many 2.0 applications, while most business-oriented SaaS, such as Sales Force, is leased on a subscription basis. There is usually little customization or control available with these applications. However, subscribers benefit from low initial costs, have access to (usually 24/7) support services, and needn't worry about hosting, installing, upgrading, or maintaining the Software.

2.

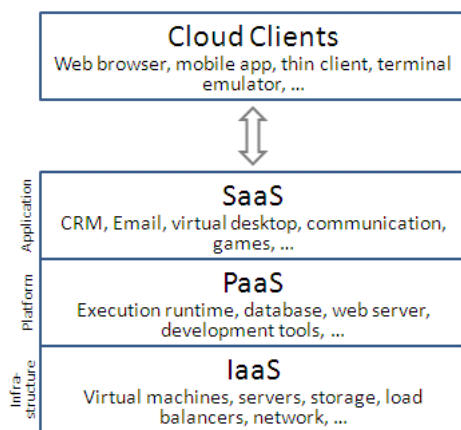
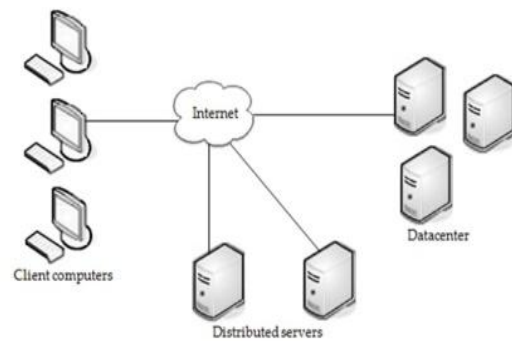


Figure2. Types of cloud computing

- Platform As a Service (PaaS) :** With PaaS, a computing platform is provided which supplies tools and a development environment to help companies build, test, and deploy Webbased applications. Businesses don't need to invest in the infrastructure required for building Web and mobile applications but can rent the use of platforms such as Windows Azure, Google AppEngine, and Force.com. Applications which are built using these provider's services, however, are usually locked into that one platform.
- Infrastructure as a Service (IaaS):** it can also be referred as Hardware as a Service (HaaS) and it involves both storage services and computing power. Amazon's Web Services, one of the major players in this area, which provides computing resources, and Simple Storage Service (S3) for data storage. Companies are using Amazon's Web Services to host or backup their websites, for content delivery, to run high performance computing simulations, to host media collections, and much more.

III. CLOUD COMPONENTS

In a simple, topological sense, a cloud computing solution is made up of several elements: clients, the datacenter, and distributed servers. Each element has a purpose and plays a specific role in delivering a functional cloud based application.



1. Internet
2. Datacenter
3. Client computers
4. Distributed servers

Providing Support for both Service Users and Service Providers:

Challenges of Cloud Computing:

1. **Service Providers:** Development Services, or Build and Test Services,
 - a. Software Engineering Methodologies and tools
 - b. How to manage clouds for Application Lifecycle Management
 - c. The Cloud manager can limit projects to certain clouds, control costs, manage security, or supplement resources during peak use
2. **Service Users:** easily usable clouds, hiding the deployment details from the user using virtualization,
3. Security and privacy are the biggest concerns.
4. Cost accounting data, and usage tracking for Multiple Clouds

ISSUES:

- ❖ **Privacy:** The cloud model has been criticized by privacy advocates for the greater ease in which the companies hosting the cloud services control, thus, can monitor at will, lawfully or unlawfully, the communication and data stored between the user and the host company.
- ❖ **Legal:** As with other changes in the landscape of computing, certain legal issues arise with cloud computing, including trademark infringement, security concerns and sharing of propriety data resources.
- ❖ **Open Source:** Open-source software has provided the foundation for many cloud computing implementations, prominent examples being the Hadoop framework and VMware's Cloud Foundry.
- ❖ **Security:** As cloud computing is achieving increased popularity, concerns are being voiced about the security issues introduced through adoption of this new model. As the uses of cloud computing increase, it is highly likely that more

criminals will try to find new ways to exploit vulnerabilities in the system. There are many underlying challenges and risks in cloud computing that increase the threat of data being compromised.

- ❖ Abuse: As with privately purchased hardware, customers can purchase the services of cloud computing for nefarious purposes. This includes password cracking and launching attacks using the purchased services.
- ❖ IT governance: The introduction of cloud computing requires an appropriate IT governance model to ensure a secured computing environment and to comply with all relevant organizational information technology policies.

Advantages of Cloud Computing:

- Lower-cost computers for users
- Better performance
- Less IT infrastructure costs
- Less maintenance costs
- Automatic software updates
- Unlimited storage capacity
- Anywhere access to your documents

Disadvantages:

- Internet connection is required
- Stored data might not be secure

IV. CONCLUSION

The rise of cloud computing is rapidly changing the landscape of information technology, and ultimately turning the long-held promise of utility computing into a reality. However, despite the significant benefits offered by cloud computing, the current technologies are not matured enough to realize its full potential. Many key challenges in this domain, including automatic resource provisioning, power management and security management, are only starting to receive attention from the research community. Therefore, we believe there is still tremendous opportunity for library professionals to make groundbreaking contributions in this field, and bring significant impact to their development in the library services.

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