Research Article

Cloud Server in Academic Knowledge Centers

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ABSTRACT: Today, we are living in the age of modern scientific inventions and technologies. In the present day, all organizations, business sectors, and institutions are adopting cloud computing technology for their future development. Especially in libraries, the current scenario of resource sharing with the customers is much different than in older days. So, the libraries must adapt and execute modern technologies like cloud computing for rapid resource sharing for customers and it helps to access the library resources in remote mode by the customers. That helps to save their valuable time and they can access and refer to the resources online made with the help of the internet. In academic libraries, most of the utilizers cannot able to find or gather relevant information via books. On such occasions, the library cloud plays an effective part in resource sharing with our utilizers. This research paper clearly deals with cloud computing and its benefits for libraries and information centers in academic.

1. INTRODUCTION

In essence, cloud computing is a type of internet-based computing that instantly provides computers and other devices with access to shared data and computing resources. The computing technology known as "cloud computing" is wholly dependent on Internet media. Users or the Service Cloud service providers must pay for the resources and services they utilize in the context of cloud computing. One type of computing is cloud computing. Technology that makes it easier to share resources and services online as opposed to keeping them on local servers/nodes or personal devices. Cloud computing, a fictitious collection of corruptible resources accessed online, allows for the separation of the processes of building an infrastructure for service delivery and providing end-user services. Using the internet and an open environment gives users a method to share scattered resources and services that are owned by many businesses, institutions, libraries, and websites (Lin & Chen, 2012).

It is a blessing for these libraries since it allows for the smooth operation of various ICT services because third-party services handle server management, upgrades, and data backup. Libraries use computers to run services like Integrated Library Management Software (ILMS), websites, portals, institutional repositories, etc. These are either kept up-to-date by the library personnel or the computer staff of the parent organization. Maintaining these services and carrying out backup and updating as and when new versions of the program get published requires investment in infrastructure, software, and employees. Applications for libraries have seen a lot of interest thanks to cloud computing. All library collections, systems, and services are expected to be moved onto the cloud within five years. Individual and freestanding library systems like LMS, OPAC, and ERMS will be replaced by cloud-based LMS, cloud-based OPAC, and cloud-based ERMS, among others.

2. RELATED WORKS

This study deals with libraries now have many options and services to connect their services with clouds thanks to cloud computing technology (ICT), which has emerged as

a boon for libraries (Kaushik & Kumar, 2013). ICT has compelled libraries and librarians to alter how they operate and process information. Libraries are advancing to an advanced level known as cloud computing in this digital age. Libraries in cloud computing do not need software, operating systems, or applications if they stay within the service provider's stated parameters. A new significance in computing is provided by cloud computing, which transforms how we create, scale, update, manage, and pay for programmes and the infrastructure that supports them.

The main topic of discussion is how Nigerian public libraries might use cloud computing technologies (Solomon & Bakare, 2022). It provides a conceptual overview of cloud computing, along with information on its capabilities and service models, such as SaaS, PaaS, and IaaS. Additionally covered in the study are storage methods for private, community, public, hybrid, and personal clouds. Along with cloud computing vendors for libraries, cloud computing proponents are emphasized. The benefits and difficulties of services that are adaptable to cloud computing technology are highlighted in the study.

It reveals that a novel approach to information and communication technology, cloud computing offers prospective advantages like lower costs, accessibility from anywhere at any time, as well as elasticity and flexibility (Sahu, 2015). This paper covers cloud computing, including its definition, key characteristics, model, constituent parts, benefits, and drawbacks. It also discusses cloud computing in libraries.

This study examined how cloud computing could be applied to library operations, with an emphasis on Nigeria (Onwubiko et al., 2021). The study involved a thorough examination of the literature. Except for the cost of the resources and access, cloud computing is viewed as a new form of computing that is offered over the Internet and gives services without a charge. These cloud computing services follow the models of Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS). Users can share resources using cloud computing services, which are also simple to manage and have low system failure rates. Cloud computing is used in libraries for collaboration, creating digital repositories, acting as a backup, automation, and providing low-cost services.

3. WHAT IS CLOUD COMPUTING?

Clients pay for software, infrastructure, platform devices, other resources, and hosting from virtual shared servers in cloud computing, which is internet-based computing. Under the cloud computing approach, information from any digital system is made available as a service. On the "Internet Cloud," users can access these services without prior knowledge of resource management.

4. SERVICE MODELS OF CLOUD COMPUTING

Software as a Service (SaaS): On-demand, the customer receives a complete application under this model. The service is provided to a single end-user by a single cloud instance. Because only one application needs to be hosted and maintained, both customers and providers save money by not having to make upfront investments in servers or software licenses. Companies like Google, Salesforce, Microsoft, Zoho, and others now offer SaaS.

Platform as a Service (PaaS): As a service, a layer of software also known as the development environment is encapsulated and made accessible, allowing for the development of subsequent higher levels of service. It is up to the customer to develop his or her own applications that use the provider's infrastructure. The LAMP platform (Linux, Apache, MySql, and PHP), limited J2EE, Ruby, and so on are some of the OS and application servers that PaaS providers provide to meet the applications' manageability and scalability requirements. Google App Engine, Force.com, and others are examples of PaaS.

Infrastructure as a Service (IaaS): As standard network services, IaaS offers fundamental computing and storage capabilities. In order to handle workloads, resources such as servers, storage systems, networking hardware, and data center space are pooled and made available.. In most cases, the client would use his own software to install it on the system. Examples such as Amazon, Go Grid, and 3 Tera come to mind.

5. MODELS OF CLOUD COMPUTING

5.1 Public Cloud

The distributed computing environment is open for being utilized by anybody who needs to join and utilize them. These are run by peddlers and applications from distant users who are likely to be connected, as well as on cloud services, storage systems, and networks like Amazon Web Services and Google's App Engine.

5.2 Private Cloud

The private cloud is a way to provide authorized services over corporate networks using a proprietary computing structure. This type of cloud computing is typically used by large businesses to enable the administrators of their information center and private network to effectively serve as in-house service providers for the corporation's users.

5.3 Hybrid Cloud

The assets in the hybrid cloud come from both public and private providers, so it has the potential to become a necessity for businesses. The corporate cloud and the public cloud are combined in the hybrid cloud.

5.4 Community Cloud

Several organizations use the community cloud, which serves a particular community with common concerns (such as mission, security, and compliance issues).

6. SPECIFICATIONS OF CLOUD COMPUTING

- Users pool their resources. In a distributed computing environment, it operates very quickly.

- Without engineers for peak loads, it ensures the "on-demand" provision of resources.

- It makes services less expensive. It ensures that it works effectively with multiple users and applications by sharing a common infrastructure.

- Because the infrastructure is provided by a third party, users can access it from anywhere in the world by simply connecting to the internet.

- Because they are installed on a single platform and accessible from a variety of locations, they are simpler to maintain than individual applications.

- Servers are more reliable and highly available because there is a low risk of infrastructure failure.

- Pay-as-you-use of resources results in savings because the company does not need to establish its own infrastructure.

- On the cloud, users can use Application Programming Interfaces (APIs) to access services and pay per use.

7. BENEFITS OF CLOUD COMPUTING

Cost Reduction: Libraries can save a lot of money by using cloud computing. The cost savings can be put toward other Library activities.

Innovation and Adaptability: Users can choose which cloud to use to get their services, which is an innovation in and of it. The services provided by the Library benefit from flexibility.

Focused on the User: Cloud computing is generally user-centered, according to observations.

We are aware that library users are always at the center of providing library services to patrons. Cloud computing is helpful in this setting.

The Openness: Any library can participate in this kind of open Cloud Computing. Library services will be further enhanced by this openness idea. Cloud computing offers participating libraries a great deal of transparency. Accessibility at anytime, anywhere: In general, cloud computing services can be accessed at any time. In terms of library services, this is the primary benefit.

Create and Work Together: Participating libraries in Cloud Computing can simultaneously collaborate in participating environments and create their own services.

8. DEMERITS OF CLOUD COMPUTING

- Internet connectivity is required in the Cloud computing environment. Cloud computing services operate smoothly if internet services operate smoothly. Cloud computing services stand to be shut down in the event of an internet issue.

- One of the most significant drawbacks of cloud computing may be this. Even the best cloud providers cannot claim to be immune to service outages.

- The data are not protected or kept private, particularly sensitive data.

- Every component in the Cloud computing environment may be accessed via the Internet. There are numerous opportunities for attack vulnerability anywhere in the internet environment.

- Service seekers have limited control flexibility in the cloud computer environment. Service providers will become monopolistic in this environment.

- Cloud computing can be expensive, especially on a small scale and for short-term projects. It is possible that overall prices will be higher than anticipated.

9. CLOUD COMPUTING IN LIBRARIES

We live in the information age of today. The collection, storage, organization, processing, and dissemination of information of library resources all rely heavily on information technology. Because of how information technology is used, the profession of library work presents numerous challenges. In order to facilitate library operations and meet the requirements of the knowledge society, new ideas and technologies are being added. Information technology, the fundamental prerequisite for advancement, has led to the automation of libraries, followed by networks and an increased emphasis on virtual libraries. The growth of digital libraries, the use of the internet, library-specific web technologies, and consortium procedures have all benefited the field of librarianship. The cloud is the newest IT innovation after the personal computer and the internet. The third IT revolution is what it is known as. A recent technological development in library science is the use of cloud computing for various tasks and to cut expenses in library operations. Professionals should be aware of cloud computing because it is a new topic and how it can be applied to library science.

10. CONCLUSION

Nowadays, most of libraries are transformed into modern featured libraries. Because the needs and expectations of the customers from the library are very high in numbers. Almost, all the resources are converted into a digital format like previous year's question papers, projects, dissertations, etc. Academic libraries need the correct tools to deliver digital-related content and resources to customers for a rapid duration. In that area, cloud computing plays a vital role in digital resource sharing to the users and they access through remote conditions with the help of the internet. Digital resources, such as e-books, and e-journals play a vital role in research-related works. It increases the growth and frequency of visitors to the library. So, they can access the resource materials from anywhere. Cloud computing merged with digital libraries in academic libraries is very essential for resource sharing and other relevant searches like web-OPAC, to know the list of holdings in a particular library for utilizer purposes.

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