CLOUD COMPUTING & ITS APPLICATION IN LIBRARIES

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ABSTRACT: -
The application of IT in libraries increasing day by day and the modern libraries are going towards virtual or digital libraries. The cloud computing is a new technology. It avoid local hosting on multiple servers.

KEYWORDS: Cloud computing, Cloud computing and libraries, IT.

INTRODUCTION

Cloud computing, one of the most exciting developments has become omnipresent among the technocrats and enthusiastic librarians world over as a technology solution as well as resource sharing venture. It is sometimes compared with the virtualization of computing power, applications and storage, thought of as a model to deploy pay-as-you-go web services or perceived to be similar to grid computing and shares characteristics with all of these technology

paradigms and more. Cloud computing, the new technology model is the use of computer resources (hardware and software) that are delivered as a service over a network. It is named after the use of cloud - shaped symbol it contains in system diagrams as an abstraction for the complex infrastructure. Cloud computing has been coined as an umbrella term to describe a category of sophisticated on-demand computing services initially offered by commercial providers such as Amazon, Google, and Microsoft. It denotes a model on which a computing infrastructure is viewed as a "cloud," from which businesses and individuals access applications from anywhere in the world on demand.

(Rajkumar Buyya and et.al 2009)

DEFINITION OF CLOUD COMPUTING:

Internet-based computing in which large groups of remote servers are networked so as to allow sharing of data-processing tasks, centralized data storage, and online access to computer services or resources. (Dictionary.com)

NIST Definition of Cloud Computing:-

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models.

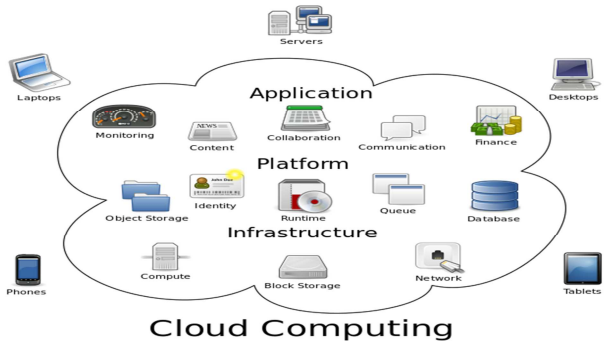

Fig. 01 from wikipedia

WHAT IS CLOUD COMPUTING:

Cloud computing is a model for delivering information technology services in which resources are retrieved from the internet through web-based tools and applications, rather than a direct connection to a server. Data and software packages are stored in servers. However, cloud computing structure allows access to information as long as an electronic device has access to the web. This type of system allows employees to work remotely**. (INVESTOPEDIA)**

ESSENTIAL CHARACTERISTICS:

On-demand self-service. A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service provider.

Broad network access. Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations).

Resource pooling. The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or datacenter). Examples of resources include storage, processing, memory, and network bandwidth.

Rapid elasticity. Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time.

Measured service. Cloud systems automatically control and optimize resource use by leveraging a metering capability1 at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service.

CLOUD COMPUTING SERVICE MODELS:

Software as a Service (SaaS):- The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure2 . The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited userspecific application configuration settings

Platform as a Service (PaaS):- The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider.3 The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.

Infrastructure as a Service (IaaS). The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited

control of select networking components (e.g., host firewalls).

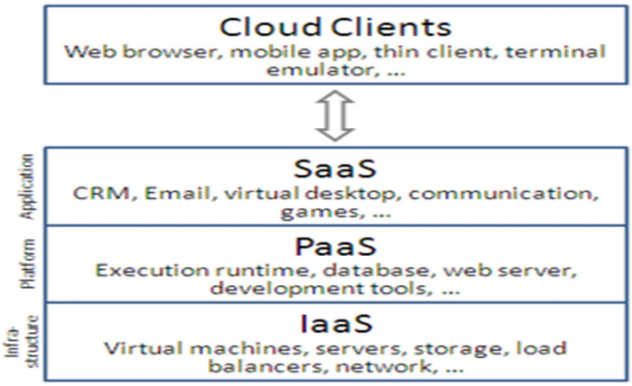

Fig. 02

CLOUD COMPUTING DEPLOYMENT MODELS:

Private cloud. The cloud infrastructure is provisioned for exclusive use by a single organization comprising multiple consumers (e.g., business units). It may be owned, managed, and operated by the organization, a third party, or some combination of them, and it may exist on or off premises.

Community cloud. The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be owned, managed, and operated by one or more of the organizations in the community, a third party, or some combination of them, and it may exist on or off premises.

Public cloud. The cloud infrastructure is provisioned for open use by the general public. It may be owned, managed, and operated by a business, academic, or government organization, or some combination of them. It exists on the premises of the cloud provider.

Hybrid cloud. The cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds).

ADVANTAGES AND DISADVANTAGES

ADVANTAGES OF CLOUD COMPUTING

Cost Savings

Perhaps, the most significant cloud computing benefit is in terms of IT cost savings. Businesses, no matter what their type or size, exist to earn money while keeping capital and operational expenses to a minimum. With cloud computing, you can save substantial capital costs with zero in-house server storage and application requirements. The lack of on-premises infrastructure also removes their associated operational costs in the form of power, air conditioning and administration costs. You pay for what is used and disengage whenever you like - there is no invested IT capital to worry about. It's a common misconception that only large businesses can afford to use the cloud, when in

fact, cloud services are extremely affordable for smaller businesses.

Reliability

With a managed service platform, cloud computing is much more reliable and consistent than in-house IT infrastructure. Most providers offer a Service Level Agreement which guarantees 24/7/365 and 99.99% availability. Your organization can benefit from a massive pool of redundant IT resources, as well as quick failover mechanism - if a server fails, hosted applications and services can easily be transited to any of the available servers.

Manageability

Cloud computing provides enhanced and simplified IT management and maintenance capabilities through central administration of resources, vendor managed infrastructure and SLA backed agreements. IT infrastructure updates and maintenance are eliminated, as all resources are maintained by the service provider. You enjoy a simple web-based user interface for accessing software, applications and services – without the need for installation - and an SLA ensures the timely and guaranteed delivery, management and maintenance of your IT services.

Strategic Edge

Ever-increasing computing resources give you a competitive edge over competitors, as the time you require for IT procurement is virtually nil. Your company can deploy mission critical applications that deliver significant business benefits, without any upfront costs and minimal provisioning time. Cloud computing allows you to forget about technology and focus on your key business activities and objectives. It can also help you to reduce the time needed to market newer applications and services.

DISADVANTAGES OF CLOUD COMPUTING

Downtime

As cloud service providers take care of a number of clients each day, they can become overwhelmed and may even come up against technical outages. This can lead to your business processes being temporarily suspended. Additionally, if your internet connection is offline, you will not be able to access any of your applications, server or data from the cloud.

Security

Although cloud service providers implement the best security standards and industry certifications, storing data and important files on external service providers always opens up risks. Using cloud-powered technologies means you need to provide your service provider with access to important business data. Meanwhile, being a public service opens up cloud service providers to security challenges on a routine basis. The ease in procuring and accessing cloud services can also give nefarious users the ability to scan, identify and exploit loopholes and vulnerabilities within a

system. For instance, in a multi-tenant cloud architecture where multiple users are hosted on the same server, a hacker might try to break into the data of other users hosted and stored on the same server. However, such exploits and loopholes are not likely to surface, and the likelihood of a compromise is not great.

Vendor Lock-In

Although cloud service providers promise that the cloud will be flexible to use and integrate, switching cloud services is something that hasn't yet completely evolved. Organizations may find it difficult to migrate their services from one vendor to another. Hosting and integrating current cloud applications on another platform may throw up interoperability and support issues. For instance, applications developed on Microsoft Development Framework (.Net) might not work properly on the Linux platform.

Limited Control

Since the cloud infrastructure is entirely owned, managed and monitored by the service provider, it transfers minimal control over to the customer. The customer can only control and manage the applications, data and services operated on top of that, not the backend infrastructure itself. Key administrative tasks such as server shell access, updating and firmware management may not be passed to the customer or end user.

APPLICATION OF CLOUD COMPUTING IN LIBRARIES:

1.Library Automation: Hosting of Library Management Software on Cloud e.g. KOHA, Libsys and etc.

2.Digital Library: Installing DSpace, Evergreen and other Software's on Cloud to get access.

CLOUD COMPUTING VENDORS FOR LIBRARIES:

There are number of vendors, such as OCLC's Webscale, Amazon and Google, Reed Elsevier, Polaris Library Systems, Ex-Libris cloud Dura Cloud etc.

CONCLUSION:

In libraries, it is used to build host digital library, library management software's with least cost. In order to achieve cloud computing in libraries, it is essential for librarians to have a better understanding and knowledge of new technology.

Reference:

• (n.d.). Retrieved January 07, 2016, from http://dictionary.reference.com/browse/cloud-computing

•Cloud, L. (n.d.). Advantages and Disadvantages of Cloud Computing. Retrieved January 8, 2016,

from http://www.levelcloud.net/why-levelcloud/cloud-education-center/advantages-and-disadvantages-of-cloud-computing/

•Cloud Computing Definition | Investopedia. (2011). Retrieved January 07, 2016, from http://www.investopedia.com/terms/c/cloud-computing.asp

•Rajkumar Buyya, Chee Shin Yeo, Srikumar Venugopal, James Broberg, Ivona Brandic, "Cloud computing and emerging IT platforms: Vision, hype, and reality for delivering

computing as the 5th utility", Future Generation Computer Systems, 2009.

•U. (2011, September). The NIST Definition of Cloud Computing. Retrieved January 21, 2016, fromhttp://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf