OVERVIEW OF CLOUD COMPUTING

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Abstract:
Innovation is moving at such a fast pace. It gives loads of intends to putting away data and recovery which is named as cloud computing. The Advanced innovation has brought forth new instruments supporting exchange of data quick starting with one spot then onto the next without moving a stage. This is cloud computing. For e.g., Google and yahoo. There is an earnest need to find out about the quickly developing innovation as it helps in improving the materials. Libraries are likewise stepping on to along these lines as it is extremely productive framework giving heaps of advantages. It gives simple access to material of low lost and it is less tedious. Distributed computing will be the best alternative for tackling the issues of libraries step by step. This paper targets giving clear thought regarding cloud computing and its related viewpoints and it use in the libraries.

Keywords: Cloud computing, Networking Attributes, SaaS, PaaS, IaaS

INTRODUCTION

In this present age of IT information is easily available with little efforts but these burning needs to store and retain this information. There are many means and methods do so. The rapidly growing technology of cc has provided a solution to a great extent. With the help of cloud computing, we can access to applications, computing infrastructure as a server all the times at every place. Cloud computing is widely embraced these days and adoption of the concept is still on rise. Cloud computing can transform the way systems are built and services are delivered, providing libraries with an opportunity to extend their impact. Everyone who is connected to the internet is probably using some type of cloud computing whether using Google's Gmail, organizing photos on Flickr, using Facebook as a social media or searching the Web with google or bing. It is essential to know more and more about the fast moving technology as it helps in improvement of matters.

DEFINITIONS

Cloud computingis web based registering whereby shared assets, programming and data are given to PCs and different gadgets on request through the web. Cloud Computing has been defined by The European Network and Information Security Agency(ENISA) as "a non-demand service model for IT provision, often based on virtualization and distributed computing technologies." In sort, cloud computing in science is a synonym for distributed computing over a network, and means the ability to run a problem or application on many connected computers at the same time. According to Mckinsey Clouds are hardware based services offering compute network and storage capacity where hardware management is highly abstracted from the buyers, incur infrastructure costs as variable OPEX co-operational expenditure and infrastructure capacity is highly elastic. The US national Institute of Standards and Technology(NIST) defines cloud computing is a model for enabling ubiquitous, convent, on demand network access to a shared pool of configurable computing resources(e.g., networks, servers, storage, applications, and released with minimal management effort or service provider Interaction.

Important characteristics of NIST definition of Cloud Computing are

1. On-demand self service
2. Broad network access
3. Resource Sharing
4. Rapid Elasticity
5. Measured service

HISTORY

Cloud computing is a new service delivery model. It forms the foundation of Cloud computing have existed for quite some time now during 1950s large scale mainframe computers became available in academia and corporations referred to as static terminals because they were used for communication. During 1960s large scale mainframe computer resources are shared by different user groups. The mainframes colossal hardware Infrastructure was costly. To make efficient use of costly mainframes a practice evolved allowed multiple users to share the physical access to the computer from multiple terminals as well as the CPU time.

During 1970s it was popularly known as RJE remote job entry process associated with IBM and DEC. IBM released an operating system called vm that allowed mainframe systems to have multiple virtual systems on a single physical computer. With the boon of information technology, more services became dependent on fast computing power of computers. Everything became dependent on computers. In 2007 Google 1 BM and several universities announced a research project, the academic Cloud computing initiative. Since then several open source projects come up for eg.

Open stack are application interfaces for deploying cloud computing facility. In July 2010, HP announced the site on mobile for emerging mobile cloud. During 2011the open Networking foundation was founded by Deutsche telecom, facebook, googal, yahoo etc. These initiatives will ensure easy deployment of hardware and better services in a cloud environment.

CLOUD COMPUTING CAN BE USEFUL FOR THE SOCIETY BY USING SERVICE MODELS
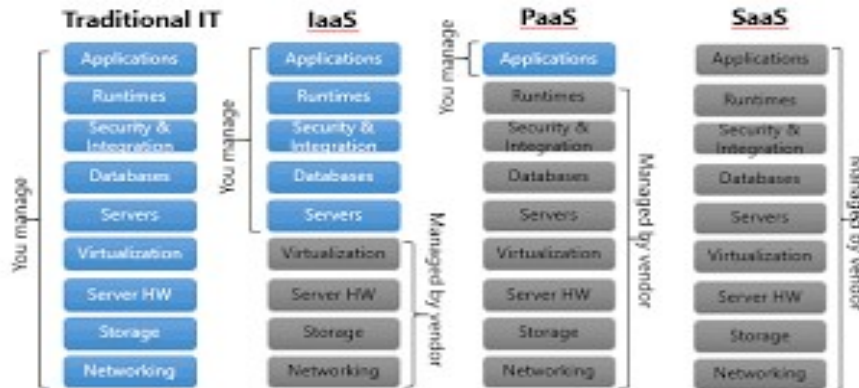
SOFTWARE-AS-A-SERVICE
Saas is a delivery model in which applications are accessed by the user using a simple interface like web browser. The users are not concerned with the underlying cloud infrastructure. It is a complete operating environment with applications, management and user interface. In this model all types of responsibilities are upon the vendors, client responsibility begins and ends with entering and managing their data. SaaS eliminates customer worries about application servers, storage and related concerns of information technology. It is not necessary for the users to buy the software, install and run, maintenance the application on their own servers. Face book, Net Suite, Google Docs are some examples of saas model.

PLATFORM-AS-A-SERVICE
Platform-as-a-service model helps in generating the computing platforms to run the software and other tools over the internet without managing the software and hardware at user end. PaaS models are providing platform to users in maintaining and supporting their IT infrastructure without spending huge amount for buying hardware and software and related technologies. In Paas models cloud providers deliver a computing platform together with hardware, operating system, web server and application developer can develop and run their software solution on cloud platform. There will be some restrictions on type of software. PaaS offers a development platform for developers' means that user write their own code and the PaaS vendor upload the code and display it online. Google App Engine, Go Grid Force.com are the examples of PaaS.

INFRASTRUCTURE-AS-A-SERVICE
This service model comprises a wide range of features, services and resources which support to build a virtual infrastructure for computing. IaaS users can deploy and run any application, software and operating system on the infrastructure that can be scaled up dynamically based on the resource needs. On this model the service provider manages the entire infrastructure and the clients are responsible for other deployment. It also referred to as hardware as a service, manages hosting and develops online requirements for user. Servers, storage system, networking equipments and space etc. are made available to handle the workload. IBM blue cloud, Eucalyptus, Rack space cloud etc. are the examples of IaaS.

ENERGY- SAVING TECHNIQUES
Now day, cloud computing has been focusing on come close to energy saving techniques for proper utilizing ICY services and this can be done if some improvement has been done regarding operation of data centre resources. Energy saving techniques in cloud computing can be energy efficient hardware, Dynamic voltage and frequency scaling, Terminal servers and thin client, virtualization of resources and energy efficient network and protocols. In the following section each of the technique is
- Energy Effective Hardware
- Dynamic voltage frequency scaling
- Terminal Servers and Thin Client
- Virtualization
- Energy saving in Network and protocols

In order to save the energy it has become essential to expand energy efficient hardware. US energy star has initiated the step regarding manufacturing IT products which are not only being worth energy saving but also being receiver for our environment.

TYPES OF CLOUD

Private Cloud: A private cloud is that type of cloud computing which is owned by an organization, individually or personally. It is an arrangement for a specific group or organization which is accessible only to that organization. In private cloud an organization converts its facilities into cloud and then provides the services to the user. Basically, private cloud is used by organizations for maintaining secrecy and privacy. Private cloud is one of the important ways to create in house resource, security measures. Private cloud is a owned network or data centre that arrange the internal services to a small group of people. That's why it is also known as internal cloud. For example:-Amazon VPC (Virtual Private Cloud), VMW are Cloud infrastructure Suite, Microsoft ECI data Centre, Institutional Cloud, EBay.

Public Cloud: A public cloud service is that service which is owned by anyone is used by others by giving charges for hiring the services just like leasing service. Public cloud is a kind of external service. It is service shared by various clients or customers. It is open to all mean to say publicly available. This secure is owned by a particular agency. The agency maintains its own norms, policies, procedures, way outs, and values, profit system, costing system and charging criteria. For examples Rack space, Amazon, Google, Microsoft Azure, IBM Smart cloud, Google App Engine, Amazon EC2, Force.com.

Hybrid Cloud: Using the various cloud computing models (i.e. Public, private, community and other models) in a combined way depending on the need and requirement of user is known as hybrid cloud. All the clouds are sustaining their uniqueness and performing together in a group. A hybrid Cloud is offering well-maintained and easily accessible application to users. Under Hybrid clouding, organizations are focusing on the requirements of users and then providing service. Hard drive is one of the way to store the information in Hybrid cloud computing. Cloud

Computing is keeping our information in mail server. For example Google Apps, Windows Azure (capable of Hybrid Cloud), VMware Vcloud(Hybrid cloud services)

Community Cloud: A group of organizations provides community cloud service to users. These types of cloud computing functions are just like venture. Community cloud is having features like mission, objectives, policies, security system and compliance consideration etc. It may be inside or outside. This type of clouding is based on the concept of economic scalability, democracy and equilibrium. For example Institutional Gmail, Google Apps, Google Apps for Government, Microsoft Government.

APPLICATION OF CLOUD COMPUTING IN VARIOUS SECTORS

What is advent, Cloud computing has occupied a very significant position in the IT Industry. Distinct practical applications are making use of the services provided by it. Arenas like medical research to agriculture educational institutes to industries are availing its services.

Educational Institutions: Cloud computing has truly revolutions: Cloud computing has truly revolutionized the erudition sector. The conventional face to face classroom techniques are increasingly being replaced with other cloud mediated exercises like smart classes using pictorial and auditory illustrations. The cloud based model gives an edge to the redundant study routine people has in their daily lives. It has also enabled remote access of erudition material and has done a great deal in assisting the progress of rustic India whilst making learning easy for them.

Industries : Cloud computing has empowered the industries to prevent varied technical and business problems that can occur while executing their own data centre's and save money by incorporating a pay per use facility. Additional costs for running their own data centre are reduced thus saving overheads and simultaneously availing cloud services. It also allows them to increase their resources. It has management of data and the records very easy for the companies like never before. They now have access to a plethora of software and hardware services without having the need to buy them all thus improving the quality of services.

Medical Field: In hospital a cloud assists in procuring patient's information by the medical professionals which enables them to access the data remotely instead of having to go through a hospital's computers. This aids in updating professionals about their patient's condition even if they are not present in the hospitals. Cloud computing is still emerging in this field. There is a lot more to come.

Banking Industry: All the banking companies across the world have become automated and are now increasingly availing cloud services, though adoption of cloud services in this sector is relatively low due to the securing issues that prevail. With new measures being taken this industry is now increasingly employing cloud services so as to reduce their cost of ownership. Core banking, communication services, on demand BI is some ways in which banks make use of cloud computing.

IMPACT OF CLOUD COMPUTING ON LIBRARIES

Cloud computing is widely used; actually it is embraced in this Technological Era. The concept is still rising day by day. It has not only transformed the systems but brought a difference in services to be provided to libraries with an opportunity to extend their impact. Anyone connected to the interest is probably using some type of cloud

computing on a regular basis- whether using Google's Gmail, organizing photos on Flicker or searching the web with Bing.

Now, the question comes is what exactly cloud computing is? The answer is, the term cloud computing "the cloud'' is essentially a metaphor for the internet. The marketers have further popularized the phrase "in the cloud" to refer to software, platforms and infrastructure that are sold as a service is remotely through the internet. These cloud services may be offered in a public, private and hybrid network. Google, Amazon, Oracle Cloud, Zoho and Microsoft Azure are some well-known cloud vendors. In Educational Institutions, Libraries have been using some cloud computing services over a decade. Online databases are accessed as cloud applications. Large union catalogs can also be defined as cloud applications. With the expansion of cloud computing, the applications of cloud computing in libraries can be applied by establishing a public cloud among many university libraries.

Libraries are shifting their services with attachment of clouds and networking with the facilities to access these services anywhere and anytime. In the libraries, the following possible areas were identified where cloud computing services and applications may be applied. In the present situation, very library needs a digital library to make their resources, information and services at an efficient level to ensure success via network. Therefore, every library is having a digital library that developed by using any digital library software. In connection to cloud based digital library software. Dura space and Fedora commons but Dura space is widely used for building digital libraries/ repositories relative to Fedora commons. Dura Cloud provides complete solutions for developing digital libraries/ repositories with standard interfaces and open

source codes for both software.

OCLC is one of the best examples for making use of cloud computing for sharing libraries data for years together. For instance, OCLC World cat services is one of the popular service for searching library data now is available on the cloud, OCLC is offering various services on cloud platform through the web share management system. Cloud computing is providing the same service to the libraries. Website hosting is one of the earliest adoptions of cloud computing as many organizations including libraries preferred to host their websites on third party service providers rather than hosting and maintaining their own servers Google sites serves as an example of a service for hosting websites outside of the library's servers and allowing for multiple editors to access the site from varied locations.

Knimbus is cloud based research platform facilitates to discover and share the scholarly content. Knimbus stands for knowledge cloud which is dedicated to knowledge discovery and collaborative space for researchers and scholars. Kimbus is currently used in over 600 academic institutions and R and D labs by scholars, researchers and scientists as well as over 50,000 researchers. Knimbus is a collaborative platform for researchers to discover and share knowledge with peer and facilitates to find and access millions of journal articles, Patents and e-books. At get registered to empower the libraries for dynamic searching and also for single point search interface, maximizes the usage of all e-resources, customized search across selected sources reduces noise and highlights relevant content and tools to support the complete research the cycle.

Currently, Information and Library Network (INFLIBNET) Centre (http://www. inflibnet.ac.in) has been incorporated Knimbus cloud service into its UGCINFONET Digital Library Consortium in order to search and retrieve scholarly contents attached therein.

Cloud computing technology offers great opportunities for libraries to build networks among the library and information science professionals as well as other interested people including information seekers by using social networking tools. The most famous social networking services viz. Twitter and Face book which play a key role in building community power. This cooperative effort of libraries will create time saving efficiencies and wider recognition, cooperative intelligence for better decision-making and provides the platform for innovation and sharing the intellectual conversations, ideas and knowledge.

In India, Cloud computing in libraries is in development phase. Libraries are trying to provide to users cloud based services. But some services such as digital libraries, Web documentation and using web2.0 technologies are running on successful modes. Some good examples of cloud computing libraries include Dura cloud, OCLC services and Google based cloud services. Now a day, many commercial as well as open sources vendors (i.e. OSS) are clubbing the cloud computing technology into their services and products. However, Cloud computing technology is not fully accepted in the Indian libraries but they are trying to develop themselves in this area.

CLOUD LIBRARIES ARE
• Worldcat
• Google docs/Google scholar
• Exlibris
• Polaris
• Library of congress
• OCLC
• Discovery service
• Encore

CLOUD SECURITY

Presently cloud computing emerging as the hottest trend in the IT industry. It is an approach allowing access to remote computing, sharing resources and storage devices. Cloud computing is a developing field and has potential to offer services to the IT marketplace as well as the other sectors. As the events are various forms are replacing the obsolete methods of storage and resource sharing in varied sectors. Education, health care industry, banking, IT industry are some such field where if implemented cloud computing is poised to take off. Many institutions have switched to Saas models and other cloud based services to meet their escalating needs for storage, software and hardware requirements. Many of them are now keen on devising the current infrastructures by employing other cloud computing alternatives. These institutions need a cheap, compelling, efficacious and a productive system to channelize their resources. Cloud computing provides such benefits. It is a highly automated cost effective service with an enlarged storage which allows the storing of data on private computer systems. But cloud computing also poses several security threats. For any institution implementing a cloud security tops the list of concerns which often refrains they employ a cloud based system. Till now efforts are being taken to combat the security yet cloud computing has changed the face of the IT sector with the plenty of services it extends. The security issue is one major drawback with cloud today. By accepting the terms of a cloud service provider we give a share of control of our data to an external source thereby becoming prone to a security breach. If we classify the security issues can be divided into two parts:

1. Security threats faced by the cloud service providers.
2. Security threats faced by the users.

The cloud is an easy target and may prove to be a problem because it can be used via an unsecure internet connection Concern about the loss of information and controls aver the loss of information and control over a cloud has also limited its greater adoption. Many measures are being taken to prevent malicious attacks on cloud. To ensure security several dimensions are given. Obliging to these by the service providers can aid data security to a great extent. These dimensions can be broadly seen as:

- Security and privacy
- Compliance
- Legal and contractual issues

Advantages in Cloud Computing

1. The biggest advantage of cloud computing is that it reduces setup costs.
2. In addition to the IT industry, even small scale business can adopt this environment
3. While considering it from the side of power management, it serves as a virtual server which is easier to implement in comparison to physical servers.
4. Hardware management failure can also be localized and rectified with relative ease.
5. Various data centers are spread throughout the country and thus it makes easy for the business to use preferred sites.
6. The assessment of data can be done any time and is highly beneficial for the IT industry in reducing workloads.
7. The cloud computing environments are easily scalable.
8. Backup recovery is very easy in infrastructure as service providers; hence there is efficient incident response whenever data needs to be recovered.
9. Service may be difficult to source and the process set-up could turn out to be time consuming.

BACK Draws OF CLOUD COMPUTING

There are restrictions on programming applications that can be run using cloud methods.

- Need for understanding- A trained person is required for taking care of the contract with the service provider with a cloud service provider, since the hardware, software, virtualization, deployment of the cloud solely relies at the provider inexperience in this part can make it hard to keep hold of it.
- Slowness- The rapidity of action is of major concern for cloud computing, lack of high speed can affect the performance. For example: to carry out a talk with the help of video conferencing using, a high and a consistent speed is necessary.
- Service Unavailability- Depends completely on an internet connection. It is useless in case of absence of an internet connection or a server breakdown and thus may affect work productivity.
- Security threats- Cloud is prone to attack by hazards and malware
- Inconsistency- A cloud suffers from issues of data and code redundancy which makes it inconsistent
- Lack of flexibility- Difficulty in upgrading the software without any loss of information.
- Cost ineffective- It may be cheaper than software installed in your computer but most often it doesn't provide all the features of the software.

These missing features may be of importance to you thus affecting your work.

CONCLUSION

Cloud computing is adopted as a pivotal tool for providing fast services. Cloud computing is an evolving service provision model, where software, platform, infrastructure, dataand hardware can be directly delivered as service to the end customers. This ensures better utilization of resources, increased efficiency and reduced operational cost. Cloud computing has become a new trend in the information and communication technology domain and has gained significant commercial success over past years. As smart mobile phone users are increasing rapidly, mobile cloud computing has also become a potent trend. Challenges like data security and standardizations are foundation for future research and development. As of now, it can be said that cloud computing is going to have a huge impact on all sectors. Its importance is prevalent in every sphere of working. No one can deny that Cloud computing will play a pivotal role in the next decade.

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