Application of Cloud Computing Models in Education

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Abstract— the cloud computing is a rapidly developing technology, which has brought significant changes and opportunities to various sector in India. It is a pervasive computing paradigm that has revolutionized how Information Technology infrastructure and services can be delivered. There is a growing interest around the utilization of cloud computing in the education sector. Education plays an essential role in maintaining the economic growth of a country. Now a days the classroom teaching is changing and students are becoming more technology oriented in his changing environment, it's critical that we think about the latest technologies to incorporate in the teaching and learning process. The survey identifies and analyses the advantages and dangers that the use of cloud computing may have for the main stakeholders in education.

Key words: Cloud Computing, Software as a Service (SaaS), Platform as a Service (PaaS), And Infrastructure as a Service (IaaS)

I. INTRODUCTION

Cloud computing is an information technology (IT) paradigm, a model for enabling ubiquitous access to common pools of configurable resources (such as computer networks, servers, storage, applications and services), which can be rapidly provisioned with minimal management effort, often over the Internet. Cloud computing allows users and enterprises with various computing capabilities to store and process data either in a privately-owned cloud, or on a third-party server posted in a data center - thus making data-accessing mechanisms more efficient and reliable[1]. Cloud computing relies on sharing of resources to achieve coherence and economy of scale, similar to a utility. Advocates note that cloud computing grants companies to avoid or minimize up-front IT infrastructure costs. As well, third-party clouds enable organizations to focus on their core businesses instead of expending resources on computer infrastructure and maintenance. Proponents also claim that cloud computing allows enterprises to get their applications up and running faster, with upgraded accordance and less maintenance, and that it enables IT teams to more rapidly adjust resources to meet fluctuating and unpredictable business demand. Cloud providers typically use a "pay-as-you-go" model. This could lead to unexpectedly high charges if chiefs are not coached with cloud-pricing models. The access of using a network of remote servers hosted on the Internet to store, Manage, and action data, rather than a local server or a personal computer.

A. Public Cloud Model

The Public Cloud Model takes systems and services to be easily available to general public[2]. A public cloud is one placed on the standard cloud computing model, in which a service provider makes resources, such as usages and storage, available to the general public over the Internet.

B. Private Cloud Model

The Private Cloud Model accepts systems and services to be accessible within an grouping[3]. Private cloud is characterized by flexibility, flexibility that is achieved by on-demand self-service, ability pooling and a measured service.

C. Hybrid Cloud Model

The Hybrid Cloud model is mix of public and private cloud. Non critical activities are acted using public cloud while the analytical actions are acted using private cloud.

D. Characteristics

- On demand self-service - A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without needing human interaction with each service provider.
- Broad network access - Capabilities are accessible over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms.
- Resource pooling - The providers computing assets are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual assets dynamically assigned and reassigned according to consumer demand.
- Rapid elasticity - Capabilities can be elastically provisioned and released, in some cases accordingly, to scale rapidly outward and inward commensurate with demand[5]. To the consumer, the capabilities applicable for provisioning often appear to be unlimited and can be appropriated in any quantity at any time.
- Measured service - Cloud systems accordingly control and optimize resource use by leveraging a metering ability at some level of abstraction appropriate to the type of service.

E. Major Service Provider

- Google 101 network
- Microsoft Azure
- Amazon's Elastic compute cloud Amazon EC2
- IBM's Cloud Burst

II. CLOUD COMPUTING IN EDUCATION

One of the biggest tests that the government faces in providing education is thelack of infrastructure and if accessible, then maintenance of that infrastructure and other issue are Procuring and maintaining a wide range of hardware and software[4]. A result to all this issue can be cloud computing. It's a set-up of computing resources-located just about anywhere-that can be shared.

A. Role of Cloud in Education

The administrator, teacher, student or the parent, now have a great time to examine how cloud based application can use students and institute or university.

B. Data Analysis and Interpretation

The data poised for this research were from both primary and secondary sources. The primary expert data were collected using questionnaires, while the secondary source datawere gathered from academic Journals, publications, the Internet and literature based on cloud computing.

III. Implementing Cloud Computing in Education System

To device the Cloud on the education we first build the system to create the cloud and upload the documents, files, images, videos on the cloud. Then we can access it from all over. In schools and colleges, students can prepare their own documents and share it with the others.

A. Benefits

- Easy access: Lesson plans, labs, grades, notes, PowerPoint slides – just about anything digital that we use in teaching is quickly uploaded and accessed anytime. Stability: Cloud Computing is now to the point of being a very stable technology that we can rely on.
- Reliability: With a handled service platform, cloud computing is much more reliable and consistent.
- Manageability: Cloud Computing provides enhanced and simplified management and maintenance capabilities.

B. Present Education System

Most of the private educational institutions have become highly dependent on message technology to service their requirements. These services are increasingly provided using Internet technologies to faculty and students and accessed from web browsers. The services are offered cheaply or freely to education, often with much higher availability than can be provided by the educational institution[7]. But in most of the government schools and colleges in India IT plays vary limited role. Most of the work is done manually form attendance to classroom teaching to examination system.

C. Security Issues

In cloud computing we are saving our important and crucial data in one place and it will be easy for hack. Preservation of data is a major security issue. Educational Institutions may consider that their data is more secure if it is hosted within the institution. Transferring data to a third party for hosting in a remote data center, not under the control of the institution on and the location of which may not be known presents a risk[6]. Another Security issue is Unsolicited advertising in which aloud providers will target users with unsolicited email or advertising.

D. Services Available To Educational Institutions

Leading cloud workers have recognized the importance of adjusting their computing services specifically to the needs of educational institutions. Some of the most widely used educational platforms are listed below:

- Microsoft Education
- Google Apps for Education
- Amazon Web Services for Education (AWS)

E. Cloud Computing In Higher Education in the Third World Countries

In most evolving countries, few children graduate from secondary school and many do not even finish primary school. In Ghana, for example, only 50 percent of children complete grade 5, and of those, less than half can comprehend a simple paragraph. The biggest threat to universal education is quite simply a lack of funding[8]. Many of the teachers in third world countries are volunteers. Certainly, they are great assets and a huge need in third world countries. There are a range of educational and technical problems in the least developed countries, especially in Sudan that occurred in previous years, to clarify and highlight:

- Weakness f government funding for the education sector
- The lack of infrastructure and buildings suitable for higher education
- Migrations teaching staff
- Lack of educational materials

F. The Cloud Computing Technology (CCT) Service Models

Cloud Computing Technology services are generally regarded as falling into three separate categories, Infrastructure as a Service (IaaS)- The IT infrastructures like processing, storage, networks and other fundamental computing resources can be used by the consumers as a service, In order to integrate/decompose physical resources IaaS uses Virtualization extensively. Platform as a Service (PaaS)- To develop cloud services and applications PaaS provides a improvement platform supporting the full-Software lifecycle[9]. PaaS requires programming environment, tools, configuration management etc.., to support the application hosting environment and Software as a Service (SaaS)- The software usage is provides to a consumer as a Service. Based on the demand the consumer can choose his software to use.

G. Cloud Computing Technology for ICT (Cct4ict) Model in Educational System

Most educational institutions have been become highly dependent on information and communication technology tools to provide solutions and also service their requirements. These services and solutions are progressively incase using Internet Services to both teaching non-teaching staff and students and accessed using web browsers. The services are presented are not cheaply or not freely to education, often with most of these educational institutions spend a lot on the various resources in order to provide quality services to their users. All the main users of the institution are connected to the CCT. Separate logins are provided for all the users for their respective work.

H. Importance of Cct4ict Model for the Teaching and Learning of ICT

- Independent Learning style
- No extra infrastructure
- No more expensive textbooks and Infrastructure
- No more outdated learning materials
- No more outdated learning materials
- No expensive software required

– No boundaries to students learning environment

IV. ISSUES IN THE USAGE OF THE CCT4ICT MODEL

CCT challenges have always been there. Companies and institutions are gradually aware of the business value that CCT brings and are taking steps towards conversion to the cloud. A smooth conversion commits an exhaustive understanding of the benefits as well as challenges involved. Like any new technology, the adoption of CCT4ICT model is not free from issues.

Some of the most important tests are as follows.

– Security and Privacy
– Service Delivery and Billing
– Interoperability and Portability
– Reliability and Availability

V. CONCLUSION

The evolution of cloud computing as a feasible result for several IT services has been in the rise for the past a lot years. Experts anticipate cloud computing to go through major adoption in the education sector in the ensuing years, and many IT rulers working in the sector think that on campus cloud programs will be greatly increased in the near future. And when these efforts turn out to be successful, more and more institutions will be willing to move most of their services to the cloud. Though the assistance associated with cloud computing are real, there are issues pertinent to automation and policies that are yet to be resolved in order for the service to attain its ability in full[10]. Large organizations of higher education are expected to invest in cloud services more than ever. Universities and colleges strive to provide a wide range of technology services.

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