

e-Learning as a Service (eLaaS) with Cloud Approach

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ABSTRACT

Electronic learning (e-Learning) takes the advantage of electronic devices, Smart mobiles, laptops, tablets, communication devices and computer, in some way to present training, -information, guidance from professionals, and educational or learning material between students, faculty and administration. Present day education applications become more pretty because researchers can access at anytime and anywhere and anyhow with low cost and high quality of service. E-Learning systems repeatedly require many software and hardware resources to deliver knowledge, information and skills. Today's several educational institutions do not have the resources and infrastructure needed to run top e-Learning solutions and for this cloud is the best solution. This projected work presents the development of a e-Learning as a Service System (e-LaaS) with cloud. Wi-Fi is available in most of the college and Universities. In this structure information is collected and sent to the cloud. Various end users such as teachers, Students, researchers, scholars, or even administration Bodies themselves can access their information from the Cloud. This System architecture provides cost efficient model for Institutions. This System architecture can provide on-demand (anytime and anywhere) data-centers, it is also known as IaaS-Infrastructure as a Service, storage, memory and computational power, usually priced per minute according to resource utilization by most of the cloud service providers.

Keywords— e-learning, Cloud, e-LaaS, IaaS , Institutions.

I. INTRODUCTION

Currently Cloud computing become more attractive area in the research field due to a demand on a elevated quality and little charge services at anytime and everywhere. Many of the offered education institutions rely only on their own database to store and process data [1]. It takes high cost to maintain the system, so far the performance is not consistent and a partial number of services can be provided. It requires data to be transmitted and processed speedily, so that Universities, Institutions, Faculty, Students and other Governing Bodies can access conveniently via Internet.

The study session is shifting. On or after when the institute or school bell rings to end of sittings or after the institute timing hours that last well into the home, students and scholar are requiring further advanced technology services from their institute or school , It's important not only to keep speed with their developing needs, but also to make them for the demands of the place of work for the next day (tomorrow). At the same moment, education organizations or institutions are under growing pressure to bring more services for less cost, and they need to find ways to offer prosperous inexpensive services and tools. Those institutions who can deliver these complicated communications environments, including the desktop applications and stand alone that employers utilize today, will be serving to students to come across superior jobs and bigger opportunities in the their bright future. For this CC can help furnish those solutions. It's an internet of network based computing resources placed just about everywhere that can be communal through

high speed internet network. They carry to education school, institutions, Universities a range of choices not found in conventional Information Technology (IT) models. In truth, the combination of software and resources we own with software and services in the cloud provides us with new options for balancing system administration, cost, and security whereas serving to improve services [11].

What's in the cloud? To a great extent what's on our desktop or in our data-center at present. For example, e-mail and face book in the cloud is, in several cases, free for institutions, schools and universities that require upgrading heritage systems and expanding services [1]. The cloud helps make certain that students, teachers, faculty, parents, staff, and other official such as Governing-Bodies have on-demand access to decisive information using any device such as mobiles, tablets, smart phones and desktop system from anywhere and at any situations.

Both private and public education community institutions can use the cloud to distribute enhanced services, still as they work with smaller amount of resources. By sharing Information Technology services in the cloud, our education institution, schools can contract out non-core services and improved concentrate on offering teachers, faculty, staff, students, and educator, the necessary tools to help them succeed [4].

As we plan our enduring, data center strategy, our institutions can benefit from different opportunities in the cloud.

II. CLOUD COMPUTING

Cloud computing (CC) is the delivery of computing different services over the Internet and is the internet based computing. CC services allow individuals and businesses to use software and hardware infrastructure that are managed by third parties at remote locations. Cloud computing Defined as

[12] virtualized nodes that are vigorously provisioned and presented as one or more UCR-Unified Computing Resources. Within the specified space of CC that e-Learning functions, Leavitt [13] defines CC as a type of client and server computing, whereas CC infrastructures are internet based and Internet-connected servers, frequently times spread across several geographical locations that address a cloud of applications and data. Clients or users usually use web 2.0 or above version browsers or keen software to access cloud applications, which they recurrently manage via application programming interfaces (APIs). Vaquero et al. [14] highlight virtualization and scalability is two important facial appearance of CC that help further optimized resource consumption.

The option to go to the cloud is not an all-or-nothing intention. There are various forms of cloud offerings, we have elastic choices about which services to get in the cloud and which to maintain on-site. Our precedence and Security necessities resolve the echelon of cloud capabilities to explore.

If we seem personally at the cloud, we'll observe three essential different sets of offerings as shown in figure 1:

SaaS-Software as a Service: The user applications, such as email, YouTube and Face-book, people use daily.

PaaS-Platform as a Service: System oriented platforms and the operating environment in which applications run. And platforms such as dot-Net, php and java for developing applications.

IaaS-Infrastructure as a Service: IT resources such as the on-demand resources and data centers.

Outsourcing a few facilities to the cloud builds the majority of what is on-site by freeing people, funds, and time. For example, with SaaS-Software as a Service, we can add applications or services, like emails, affordably. With PaaS-Platform as a Service, we can deliver platform oriented services broadly devoid of having to handle the IT infrastructure. With IaaS-Infrastructure as a Service, we get pay-as-you-go datacenter capacity for adding storage space, CPUs, networking bandwidth, or Web hosting servers.

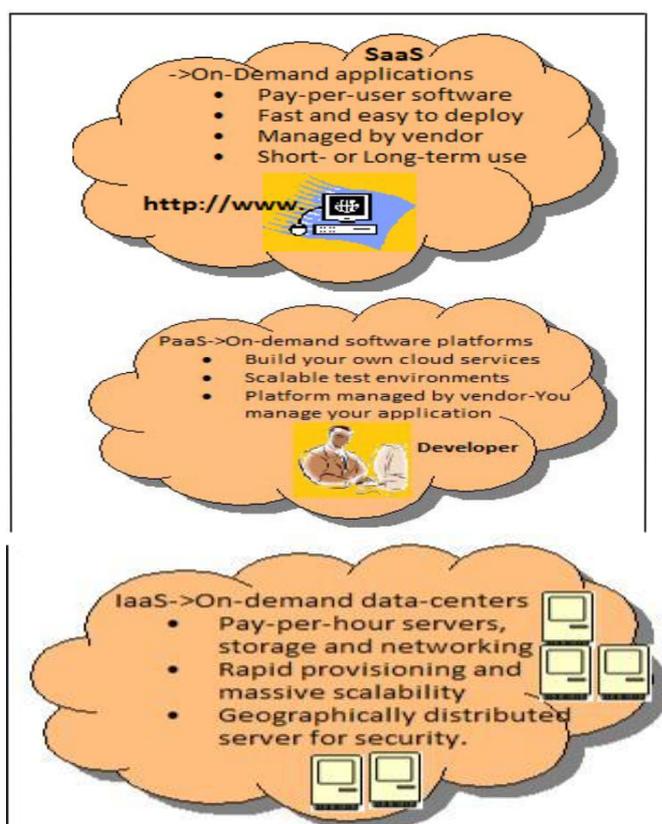


Fig. 1. Three general types of cloud services:SaaS, PaaS, and IaaS

A. IaaS for Institutions

Nowadays that the cloud proffers servers, database for storage and networks bandwidth as a service, technology is no longer bound by the conventional on-site IT sector. An on-demand datacenter places virtually infinite computing power into the hands of even the smallest schooling organization. On-demand datacenters also referred as ³IaaS⁷. ³IaaS⁷ provide compute power, storage space, and, memory allocation based on the usage and consumption of resources and typically priced per hour. Some call IaaS exposed metal on demand. We pay for only what we utilize, and the service supplies all the facility we require, but at the same time we are responsible observing, supervising, and patching our on-demand infrastructure. One huge benefit of IaaS is that it proffers a cloud-based data center without entailing us to install new latest apparatus (devices) or to wait for the hardware procurement procedure. This means we can obtain IT resources at our university, college, and school that or else might not be on hand.

Through IaaS, funds come from infrastructure and hardware expenditure but not necessarily from conscription since we are still responsible for patch management, system management, redundancy, failover, backup and additional management errands. Depending on the category of service, an IaaS giver naturally handles monitoring, load balancing, and scaling automatically, and we handle our cloud deployments. The abbreviation "CC" used to denote the use of cloud or internet based computers for variety of services. The cloud offers storage of data, network bandwidth, and servers as a service.

In this paper section 3 presents the related work and Benefits of Educational institute in the Cloud [4, 5]. In section 4 describes the higher quality of education architecture. In section 5 describes the proposed work system architecture and its implementation.

III. RELATED WORK

During in the last few years, a lot of research scholar's works are paying attention on Cloud computing in education. The Education Institutes equipped with Wi-Fi, Students, Faculty and Govt Bodies in Institutes use this networks to transmit their information and share their information.

BMet -Birmingham Metropolitan College is one of the largest colleges in the United Kingdom (UK) [5], it offering a range of pedagogic and professional courses to more than 35,500 learners every year. Employing more than 1450 people, BMet has three major campuses and many satellite centers. The institution prides itself on residual at the forefront of advances in teaching institutes, in that way delivering a transformational education-learning experience to students.

IBM and BMet created the classroom in the cloud idea, a solution based on IBM SmartCloud for Social Business, an IBM SaaS service offering. This would be the biggest 'SmartCloud' for Social Business achievement in Europe

Two educational technologies are widespread currently-Moodle environment [19] and Joomla extension module for education [18]. Moodle is an open source course management system and is a tutoring oriented atmosphere containing dedicated course and management features like tasks assignment module, multiple choice module, glossary module, etc. [20] to gain knowledge from various sources and also support the learning and teaching process.

In malice of moodle's wide spread popularity points out some problems. They are:-

- a) Many students are not willing to use the learning environment
- b) Both teachers and students find it difficult to understand how to use the platform in the beginning.

The reasons for the above could be that teachers and students only use Moodle when they need it. Therefore, [21] recommend environments where teachers, staff, students and Govt Bodies actively communicate and collaborate with each other.

- c) Not all applications run in cloud

Benefits of Educational Institute in cloud

Our teaching staff will be able to collaborate with other departments in a way that simply was not possible before, sharing various resources and working together in real time. We hope that providing cutting-edge technology to support their teaching will further inspire both teachers and students, resulting in greater success for Institutes as shown in the figure 2

The Group of Institutions will collaborate across their departments to increase e-learning. The teacher can take help from our teacher through this education cloud and students can access their favourite subject videos through this cloud. To implement a cloud between these institutions we required wireless or wire- oriented networks to connect departments and one good company which provide cloud storage among these institutions.

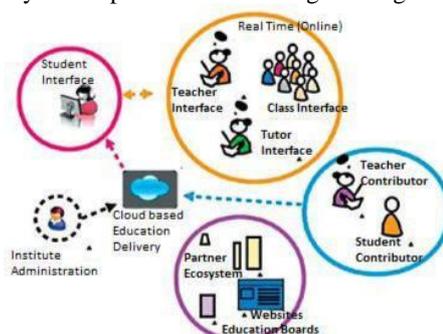


Fig. 2. Educational institute in the Cloud

The following resources are necessary for company to Universities, institutes and schools to leverage for their respective projects:

- A group of processors executing/running in an open source implementation of company's and published computing infrastructure
- Parallel computing techniques.
- Administration, monitoring and dynamic resource provisioning company itself.

IV. HIGHER QUALITY OF EDUCATION INTERACTIVE ARCHITECTURE

ARCHITECTURE

Through collaborative learning students gain knowledge and strengthen communication skills. Teachers can use multimedia to improve the teaching content and also can clear doubts that students may raise during the course. Hence teaching and learning processes become more interactive. TEQIP-Technical Education Quality Improvement Programme, AICTE-All India Council for Technical Education and NBA-National Board of Accreditation members can access the important documents from the institutes and monitors the institutions for:

- Intensification Institutions to turn out high valuable engineers for enhanced employability.
- Scaling-up PG-postgraduate tutoring and demand-driven Research and Development (R&D) and novelty.
- Creating innovative Centers of Excellence for paying attention on relevant research.
- Training of faculty by providing faculty development program for effective Learning & Teaching, and
- Improve the quality of Institutional and System Management efficiency.

This interactive mode of the cloud architecture is show in figure 3.

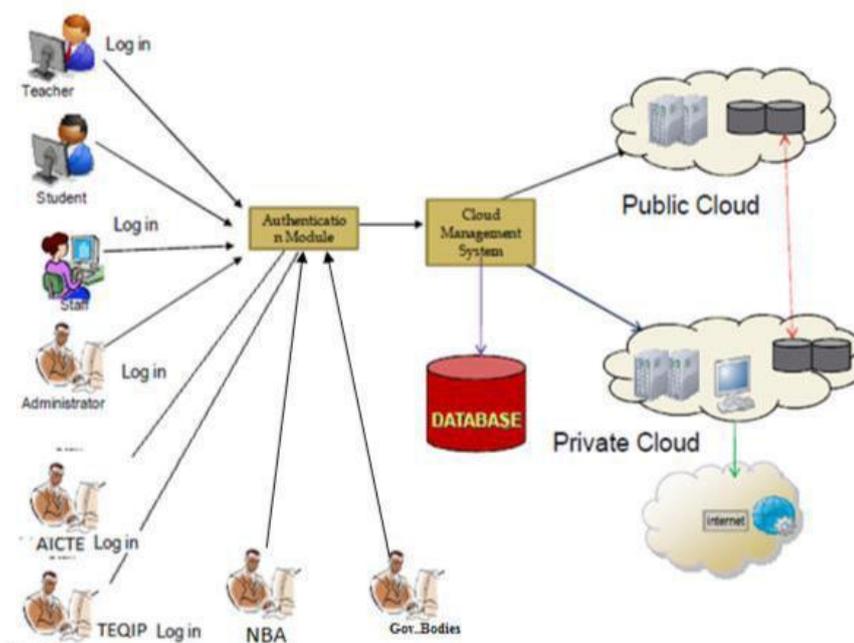


Fig. 3. Interactive mode of the proposed architecture

V. PROPOSED WORK

The proposed architecture for Wi-Fi Central Server integrated for Collaborative e-Learning as a Service System [2, 7] as shown in the figure 4. In this paper we are connecting departments through Wi-Fi [10] Wireless network and Providing Collaborative Environment for institutes, AICTE, Universities, TEQIP, NBA and Other Govt Bodies.

By using this cloud environment students, Faculty and Govt Officials can easily access the files, real-time Teaching, important documents which is related to NBA and TEQIP.

In this paper we are connecting institute departments with Wi-Fi network and the data from departments transmitted through central server to cloud. Departments at institutes can able to share file and able to give security permissions [11] for the files.

The Cloud Environment is provided by any Service Oriented Company (ex: Amazon, Google).

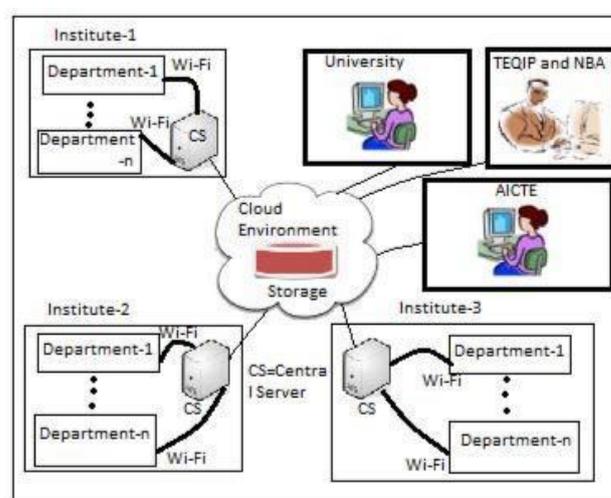


Fig. 4. Wi-Fi Central Server integrated with Cloud for e-Learning as a Service System

Instead of building our own infrastructure and taking amount time and assets away from our organization, so we can use Amazon web services or Google cloud Infrastructure.

For storage infrastructure the Amazon and Google provides the cloud to storage, to protect and to share data. Amazon and Google Cloud (GC) Storage is offered for a low monthly invoice based on the quantity of information we store.

VI. CONCLUSION

In this proposed work, we have verified the use of Wi-Fi Central Server network integrated with Cloud for e-Learning as a Service System (eLaaS). It gives a number of featured components, as well as security and privacy control, Wi-Fi Cloud integration mechanism, dynamic collaboration among teaching staff and clouds to allow many electronic education (e-Learning) services. And also present our most important result of development. Additionally, a cloud computing atmosphere offers suppleness in constructing low cost and scalable record systems.

REFERENCES

- [1] Cloud Computing in Education by Microsoft Education white paper.
- [2] WSN INTEGRATED CLOUD FOR AUTOMATED TELEMEDICINE (ATM) BASED e-HEALTHCARE APPLICATIONS, by Perumal.B
- [3] Daily Life Activity Tracking Application for Smart Homes using Android Smartphone by Muhammad Fahim, Iram Fatima, Sungweng Lee, Young-Koo Lee, Ubiquitous Computing Laboratory, Department of Computer Engineering, Kyung Hee University, Korea.
- [4] Cloud Computing in Indian Healthcare Sector Praveen Srivastava, Rajiv Yadav, Priti Razdan.
- [5] Brimhingham metropolitan college creates "class room in the cloud"by IBM
- [6] Zynga Grows Social Gaming Site with RightScale.
- [7] Nathan Botts,Brian Thoms,et al, computing architectures for the undeserved;Public health cyber infrastructures through a network of health ATMshicss-43,20102010
- [8] Avila-Garcia, M.S.; Trefethen, A.E.; Brady, M.; Gleeson, F.;Goodman, D., Lowering the Barriers to Cancer Imaging, IEEE Fourth InternationalConference on eScience, 2008, pp.63-70.
- [9] Gregorio Lopez,Victor Custodio, Jose Ignacio Moreno, Location-Aware System for Wearable Physiological Monitoring within Hospital Facilities, IEEE 21st International Symposium on Personal Indoor and Mobile Radio Communications, 26-30 Sept. 2010,pp. 2609 - 2614
- [10] Facilities, IEEE 21st International Symposium on Personal Indoor and Mobile Radio Communications, 26-30 Sept. 2010,pp. 2609 -2614
- [10]<http://www.creativeworld9.com/2011/04/abstract-and-full-paper-on-wifi.html>
- [11] Security in Wireless Data Networks: A Survey Paper by Abdel-Karim R. Al Tamimi
- [12] R.Buyya, cs yeo and S Venugopal "Market oriented cloud computing : Vision, hype, and reality for delivering it services as computing utilities CORR,2008
- [13] Leavitt, N. (2009). Is Cloud Computing Really Ready for Prime Time? IEEE Computer Society, 2009. 42(1): p. 15-20.
- [14] Vaquero, L. M., Rodero-Merino, L., Caceres, J., and Lindner, M. 2008. A break in the clouds: towards a cloud definition. SIGCOMM Comput. Commun. Rev. 39, 1 (Dec. 2008), 50-55.
- [15] Cloud Computing on Wikipedia, en.wikipedia.org/wiki/
- [16] Google App Engine, URL <http://code.google.com/appengine>
- [17] Cloud Computing and Education". Anti Essays<http://www.antiessays.com/freeessays/127176.html>
- [18] Brazdekis V,2010 et al ;E-Education: Science, Study and Busines. In: Proceedings of 3rd International Conference on Advanced Learning Technologies and Applications, 12±19.
- [19] Karazinas, E., Kardzys, E., Matulaitis, E. (2010). KTU EMTC Moodle paslaugos. E-Education: Science, Study and Busines. In: Proceedings of 3rd International Conference on Advanced Learning Technologies and Applications, 107±110 (in Lithuanian).
- [20] Docs.moodle.org, 2011. Features - MoodleDocs. [online] Available from: <http://docs.moodle.org/20/en/Features> [Accessed 26 May 2015].
- [21] Miseviciene, R., Budnikas, G. and Ambraziene, D., 2011. Application of Cloud Computing at KTU: MS Live@Edu Case. Informatics in education, 10 (2), 259-270.
- [22] Saug emin e N(2010) e-studies in the traditional higher education institution; teacher attitudes,competencies and institutional support for them. Innovative trends in e-Learning. 52-57