

A Review on Use of Cloud in Education Sector

Vishal S. Patil^{1*}, Pooja Kale², Priyanka Sawale³

¹Computer Science and Engineering, Anuradha Engineering College, Sant Gadgebaba Amravati, Chikhli, India

²Computer Science and Engineering, Anuradha Engineering College, Sant Gadgebaba Amravati, Chikhli, India

³Computer Science and Engineering, Anuradha Engineering College, Sant Gadgebaba Amravati, Chikhli, India

*Corresponding Author: vpatil1180@gmail.com,

Available online at: www.ijcseonline.org

Received: 30/Jan//2018, Revised: 09/Feb2018, Accepted: 21/Feb/2018, Published: 28/Feb/2018

Abstract— Cloud computing is rising field in computing . it is vast technology enhancing day by day when people are online they can get faster access to their data due to massive storage. It is the way to maximise capacity and capabilities without spending a lot to buy the infrastructure and software cloud computing is also involved in education sector ,because education is highly important in today's life. In this paper we show hoe cloud computing used in education sector to improve teaching and learning methodology. As education is not just restricted to classroom with student today's education is heavily depend on information technology. Cloud provide solution for that user use the platform and application on-campus or off-campus or combination of both depending on need. It offer service at least cost. In this paper we proposed architectures for cloud and did comparative analysis to make more secure data over cloud every technology has security threats.

Keywords— Cloud, E-learning , Threats.

I. INTRODUCTION

The evolution of distributed computing has changed the working of scientific and commercial application. this progress has evolved several newer applications. The latest evolution of distributed computing is cloud computing.[1] Cloud computing means storing and accessing data and programs over the internet instead of computer hard drive. In other words cloud computing provides shared resources, software and information through internet as a PAYGO(Pay-as you-go) basis.

Cloud computing can be a welcomed optioned in the universities and educational institutes for studies. It gives a better choice and flexibility to the IT departments by building multipurpose computational infrastructure once and then use sit for several purposes for several times.

Teaching is now not just restricted to classroom with students. Today Education is heavily dependent on Information technology. The rate of IT technology is changing and which puts more extra financial burden on institute. Continuous upgrading hardware and software is difficult and also it leads high cost to maintain them. Cloud Computing provides the solution for this problem. With the help of cloud computing the user uses the platform and application on-campus or off-campus or combination of both depending on the institutions need. It offers services at the least cost to users like student, staff who can acquire it anywhere any time.

Rest of the paper is organized as follows, Section I contains the introduction of cloud in education sector,

Section II contains the related work and brief history of cloud, Section III contains methodology that is System Design and Architecture ,component of the system, system design, advantages on cloud in education sector, Section IV concludes research work with future direction.

II. RELATED WORK

Cloud Computing

Cloud computing is an information technology paradigm that enables ubiquitous access to shared pools of configurable system resources and higher-level services that can rapidly provisioned with minimal management effort, often over the internet . cloud computing relies on sharing of resources to achieve coherence and economies of scale, similar to public utility.

National institute of stander and technology (NIST) has given a definition for cloud computing "which says" cloud computing is a model for enabling convenient on-demand network access to share pool of configurable computing resources that can be frequently provisioned and released with less management effort or service provider information.

Cloud computing is already used extensively in education free or low cost cloud-based services are used daily by learners and educators to support learning , social interaction , content creation, publishing and collaboration. Some major example of cloud computing services include

Google Drive, Amazon cloud drive, Apple cloud , Microsoft skydrive, Humyo. It is catageries into three different level[2]

1. SaaS (Software as a Service)
2. PaaS (Platform as a Service)
3. IaaS (infrastructure as aService)

Cloud In Education Sector

As we know that today's education is based on the marks , grades and figures. But in this compitative world we have some practical knowledge reflective thinking and some practices [3] practical knowledge has great significance to be in competition now a days for this reasons to impart the practical knowledge institute has to built lasts configured laboratory incurred highest cost in hardware configuration and due to technological obsolescence it will becoming recurring cost for the institute. There is need to find some feasible solution to overcome from such type of problem the institute can subscribe a service from any cloud service provider on bases of pay as you go.

Implementation of cloud computing in education sector

The following diagram shows how the educational institute is using various services of Education cloud in departing quality education.

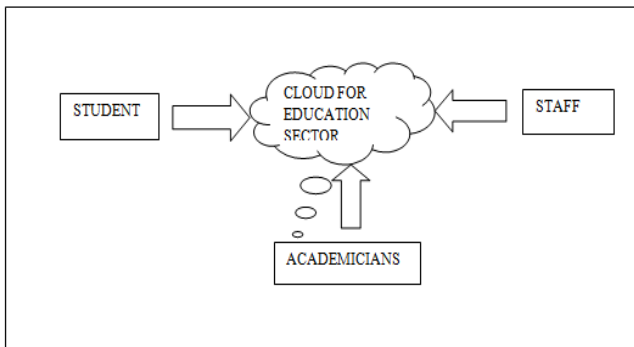


Fig.1. Education Cloud For Different User

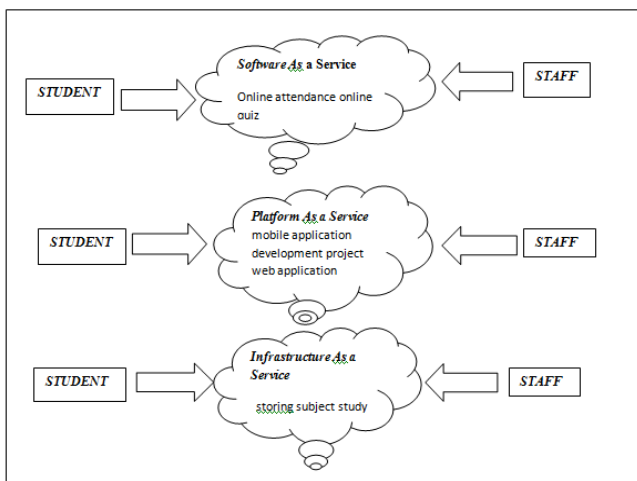


Fig.2. Various Services Of Education Cloud

The potential users of cloud are students, staff or academicians. Each user has their own credentials to access the respective cloud services. Adopting SAAS of cloud ,teaching staff can maintain the attendance ,conduct online quiz and many more with respective software packages. Adopting PAAS institute can organize practical sessions as and when needed from education cloud .for e.g. developing projects like mobile apps,web apps,etc. adopting IAAS staff can upload their study material or any related content on education cloud and student can access these material and content 24*7*365.[4]

III. METHODOLOGY

Online Education E-learning

The most recent years, the nature of the internet was continually hinting at change from a spot used to scrutinize site pages to a circumstance that allows end-customers to run programming applications. Instinct and participation have transformed into the watchwords of the new web content. There is surely the future fits in with the web 3.0. there are a couple appropriated processing organization supplier that offer sponsorship for enlightening system

Cloud Based E-learning Architecture

An architecture based on cloud computing with the name "cloud education" the model contain physical hardware layer, virtualization layer and security certification system see fig.3

1. **Physical hardware layer** is a basic platform in model , including servers, storage equipment and network equipment.
2. **Virtualization layer** with the feature: dynamic configuration ,distributed deployment , fee measurement realize the five characteristics of cloud computing . the goal of virtualization layer is to break completely information is lands based on existing regional through the distributed technology and virtualization technology. It has three part : virtual servers , virtual storages and virtual database.[5]
3. **Education middleware layer** is the core layer, because it is the basic business platform . this layer is different from existing and all information attached to it on different computing node including ordinary file and database . so, all application systems on the middleware layer.
4. **Application program interface layer** can gurantee model's scalability. Because of the diversity of the existing application system and an application system cannot satisfy all the needs of customers. In this layer alsoprovide the necessary interface be side, and still need to be able to provide hosting service.

5. **Management system** mainly watches physical condition, virtualization software, hardware and software, open API. Management system can enhance the safety of the software platform.
6. **Security system** include identity authentication ,single point login, virtualization software and hardware access control and audit , the education middleware and open API access control.[6]

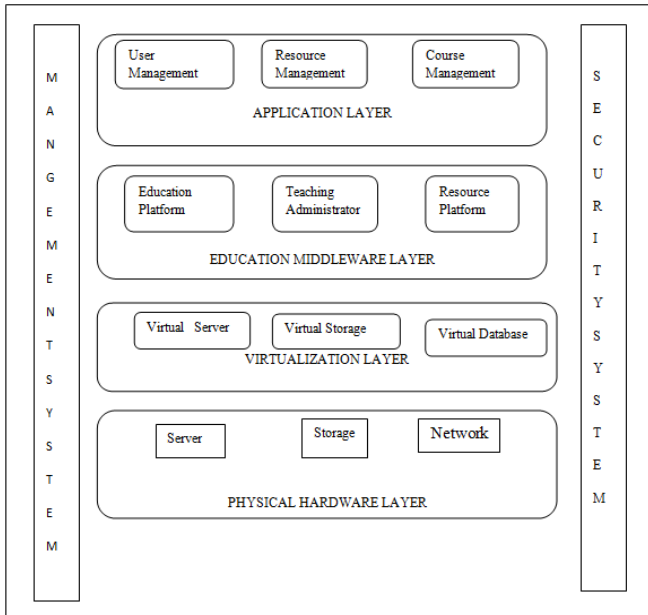


Fig..3. Architecture Of Cloud Education Model

Information Security Threats Analysis For E-learning

Point of interest of E-learning is that is that client can be anyplace and at whatever time to get to the learning material . then again, given that the internet is constantly presented to the data security dangers, the shots of client confronting the danger are likely high.[7]

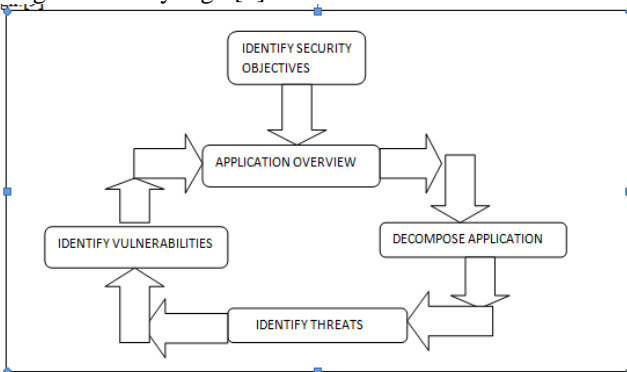


Fig.4. Security Architecture For E-learning

□ Threat Analysis [8]

Threat analysis is a procedure of Detection, identification and assessment of vulnerabilities of an operation or framework. Dangers are investigated as for their probability of event, their conceivable effect on individual clients and framework and the worldwide risk they represent Threats analysis model for e-learning for this study consists of 5 steps.

□ Step 1- Identify security objectives:

The threats analysis starts with identifying the objectives of security in e-learning application. The main elements of security are confidentiality, integrity and availability

□ Step 2-Application overview

In this step, applications in the e-learning environment were recognized. Applications recorded are: Virtual Learning Environment (VLE), enlistment, account, understudy organization, affirmation, portable learning and virtual learning. VLE comprise of online course Administration, course administration and specialized instruments. The performing artists and parts in every application are like wise recorded in this stride. The performers are separated into two gatherings that are enlisted and unregistered clients. The enrolled clients are: Delivery Coordinator, (System) Administrator, Online Course Coordinator, Course Manager (Instructors or Facilitators), Discussion Facilitator or Moderator, Students, Stake Holder or Top Management. The unregistered clients are the visitor or guests and the supports.

□ Step 3 –Identify Application Vulnerabilities

The security vulnerabilities for each application in e-learning were identified. This step uses the classes of common application vulnerabilities categories

□ Step 4 -Identify Threats

The details of threats were characterized in this step. The possible attacks is defined whether it is intentional threats or unintentional threats. These attacks were also reflected whether they will give effect of fabrication, modification, interruption or interception to the information.

□ Step 5 –Analysis of Threats

After completing the four steps, risk of each threat is measured by allocating the probability of event and effect to individual or framework. The danger assessment is utilizing the danger assessment matrix proposed by Barbeau . Dangers got from the risk examination were ordered in three fundamental gatherings to be specific minor, major and basic. The rundown of the dangers investigation result has been changed over to the e-learning threats risk framework

Benefits of cloud computing for institutions and student

The development of educational cloud, new web applications such as lecture tools, slide share etc. Allows the lecture to get their work done in their web browsers rather storing and carrying it on the hard drive. Its gives the benefits such as ;[9]

- Access the first from anywhere

- Stop worrying about additional software licenses
- Share content more easily
- Get things done without software hassles
- Get things done without software hassles
- Get things done without software hassles
- 24*7 access to infrastructure and content
- Protection of environment by using green technologies.

IV. CONCLUSION

Cloud computing is definitely one of the major innovation that entered worldwide classroom in recent years. With the ability to cut IT costs and at the same time create a modern collaborative environment, educational institutions can see some important benefits from moving to the cloud modernizing learning processes and introducing the latest technologies in classrooms encourage student to develop skill and knowledge necessary for achieving their academic and professional goals. From this prospective , it is obvious how valuable are source the is in the education sector. Together with other forms of technology implementation , the could can substantially increase learning opportunities for students all over the world ,and eventually contribute to equipping future generations with skills and competences necessary for international career advancements.

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Authors Profile

Prof. Vishal S Patil pursued Bachelor of Engineering from SGBAU Amravati University of Maharashtra ,in 2012 and Master of Engineering from SGBAU Amravati University of Maharashtra ,in 2014. He is currently working as Assistant Professor in Department of Computer Science & Engineering, at Anuradha Engineering College Chikhli Since July 2014M.S. India



Miss. Pooja Kale pursuing Bachelor of Engineering in Computer Science & Engineering Department from Anuradha Engineering College of SGBAU Amravati



Miss. Priyanka Sawale pursuing Bachelor of Engineering in Computer Science & Engineering Department from Anuradha Engineering College of SGBAU Amravati

