

Cloud Computing: A Future e-Learning Environment

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Abstract: Cloud Computing is a growing area for research and development fields. Whenever large data volume is required to store online then Clouds play important role to manage such all the things. In this paper, we have focused on need and importance of cloud computing for e Learning. There are various LMS (Learning Management System) for online learning and those are available for easy to use. Educators, students and learners who are really wanted to make their life easy and follow the information where they are available at any time can use these LMSs.

Keywords: Cloud Computing; LMS; e-Learning; Services.

I. INTRODUCTION

It is highly demanding issue in education and E-Learning in the world about the advantages and disadvantages of this system of education. So, in this paper we will direct from E-Learning calculation to phase of implementation. Now, problems are troubleshoot for proving the importance of E-Learning and it has been switched to E-Learning era, most educational institutions support E-Learning systems which require many hardware and software resources.

The educational cloud provides give a beautiful idea to such a problem where any educational institution requires transforming its system environment to E-Learning system. There are two kind of clouds one to build its own private cloud or to go to a specific service provider to share in a pubic cloud after defining some parameters. All the users require a host in a data center somewhere in everywhere, or even many data centers distributed around the world, and cloud computing providers deliver common applications online that are accessed from web browsers, also can provide a storage unit to store all beginner people documents.

II. CLOUD COMPUTING

Cloud computing is a structured model that defines computing services, in which data as well as resources are retrieved from cloud service provider via internet through some well-formed web-based tool and application. Cloud Computing is nothing but a collection of computing resources and services pooled together and is provided to the users on pay-as-needed basis [2].

Cloud computing is a computing and it is based on a new model. It is the next generation network computing platforms core technologies. It builds virtualization high computing; with on demand rent way, which provides data storage, analysis and scientific computing, services through the distributed computing model and the resource pool technology. Cloud computing is also a kind of distributed computing. By using the virtualization technology, it will be distributed in the network computer resources of idle, which combined into one large resource pool, which is treated as a high computing capacity of the computer. Dynamic system uses computing node and all kinds of application system follow up need for computing

resources, storage space and different software service, fully realize the dynamic autonomy function [1].

III. CLOUD ARCHITECTURE

Cloud computing is composed by several kinds of systems like grid computing, cluster computing etc. It is a collection of millions of users. Cloud architecture consists of software applications, which use Internet-accessible on-demand services. So, these applications are considered as an essential computing infrastructure that is used when it is required (such as processing a user request) and to perform a specific job by giving up unwanted resources. It also has needed resources on-demand (like compute servers or storage) [3].

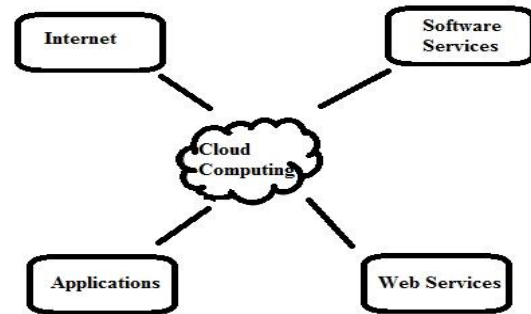


Fig. 1: Cloud Architecture

Cloud architectures are underlying on infrastructure which us used only when it is needed that draw the necessary resources on demand and perform a specific job, then relinquish the unneeded resource and often dispose them after the job is done.

These services are easy to access anywhere with the cloud computing as a one point or hub. There cloud be many difficulties addressing by big level of data processing. A cloud can interact with user or applications (client) in different ways by using its services. Cloud computing has three different delivery models. They are Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). [5].

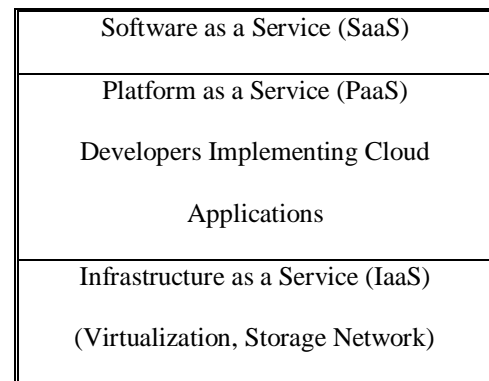


Fig. 2: Cloud Architecture

A. Infrastructure as a Service (IaaS)

This administration is the establishment of all the cloud benefits. Cloud clients promptly utilize IT essential foundations (preparing, crude stockpiling, systems, firewalls, and other fundamental figuring assets) gave by sellers in the IaaS cloud in virtual stages. Applications and assets are put on these bases accordingly to a great degree diminished gigantic starting venture, equipment is totally dynamic and customers utilize framework as an administration without the need to think about the basic complexities, they can specifically get to assets and capacity over the system. Virtualization is comprehensively utilized as a part of IaaS cloud with a specific end goal to coordinate and blend physical assets to meet expanding or shortening asset request from the clients. Virtualization fundamental procedure is to create free virtual machines (VM) that are isolated from both the hidden equipment and different VMs, this system is not the same as multi-occupancy display, which focuses to change over the application programming engineering in a manner that few cases from numerous cloud clients can keep running on a solitary application (i.e. the same rationale machine). Samples of IaaS incorporate Private cloud, Amazon Elastic Compute Cloud (EC2), Rackspace Joyent, IBM Computing on Demand, Windows Server and System Center and VMware [6] [7].

B. Platform as a Service (PaaS)

This administration demonstrate lies specifically above (IaaS) on the stack, its objective is not end-clients, but rather the designers. It gives programming situations (PE) and execution situations (EE) where defensive programming written in a particular programming dialect can be executed. At this level, cloud merchants extricate everything up to Operating System and middleware. Its implies that sellers give the fundamental equipment innovation, for example, improvement apparatuses and programming for building application to client, working frameworks, system backing and Database arrangements. It offers benefits for every phase of programming advancement, testing and upkeep furthermore sets of programming dialects, which clients can use to add to their own particular applications. Business illustrations for (PaaS) incorporate Microsoft Windows Azure and Google App Engine [7] [8].

C. Software as a Service (SaaS)

This administration gives a cloud-based establishment to programming and applications over the system on request. Different end clients or associations can get to SaaS web conveyed substance. They are accessible by means of Internet program on a pay-as-you go premise. The favorable circumstances from SaaS administration are: effortlessness of joining as client just need one program, lower cost as the server farm exist inside of the cloud, and versatility as client can add clients to get the same advantages of monetarily authorized as required. By slighting the request to introduce and run the application on the client's PC, SaaS facilitates the client's heap of programming upkeep, continuous operation, and backing. Consequently, realize that the contrast in the middle of SaaS and PaaS is that SaaS just has completed cloud applications though PaaS displays an improvement stage that has both finished and progressing cloud applications. Most broadly utilized samples of SaaS incorporate Gmail, Google Docs,

Exchange online Business Productivity Online Suite, CRM Online, and Salesforce.com [9] [7].

IV. CLOUD BASED E-LEARNING

E-learning cloud is a relocation of distributed computing innovation in the field of e-realizing, which is a future e-learning foundation, including all the fundamental equipment and programming figuring assets taking part in eLearning. After these processing assets are virtualized, they can be managed as administrations for instructive foundations, understudies and organizations to lease figuring assets.

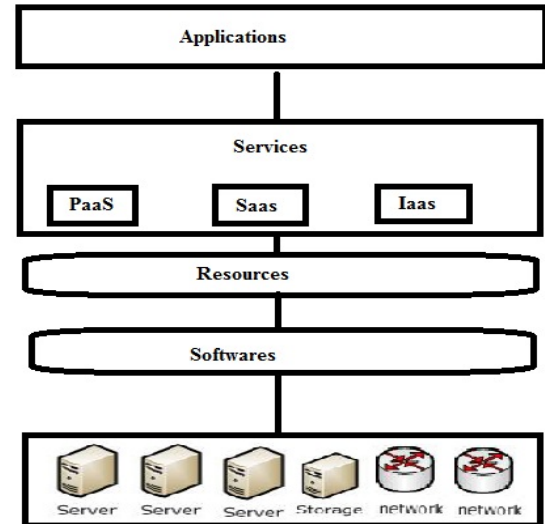


Fig. 3: E-learning Cloud Architecture [10]

E-learning benefits have developed since PCs were initially utilized as a part of training. There is a pattern to move towards mixed learning benefits, where PC based exercises are incorporated with commonsense or classroom-based circumstances.

V. ADVANTAGES OF CLOUD BASED E-LEARNING

There are following advantages.

A. Easy to setup and maintain

E-learning benefits have developed since PCs were initially utilized as a part of training. There is a pattern to move towards mixed learning benefits, where PC based exercises are incorporated with commonsense or classroom-based circumstances.

B. Cloud based eLearning platforms are cost efficient

This is most likely going to be the point that does what needs to be done with upper administration. Putting resources into a cloud based eLearning stage is entirely taken a toll productive than buying programming based eLearning alternative. You pay for what you utilize, as opposed to spending valuable assets on elements that your association need not bother with. You additionally do not need to pay any setup charges, and moves up to the framework come at no additional cost.

C. Improves employee retention

Representatives who have entry to web learning materials and ability improvement assets will probably stay put. It's a basic certainty. In the event that they realize that they can get the devices they have to carry out their occupation

successfully, they are more fulfilled and certain while at work. A cloud based eLearning stage gives your workers access to round-the-clock internet preparing, so they can add to their aptitudes when it is most advantageous for them.

D. Cloud based eLearning platforms are dependable

One of the essential reservations that numerous administrators have about changing to the cloud is that it is not tried and true. Nevertheless, neighborhood servers are regularly less solid than the cloud, as it is far simpler to lose reports because of burglary, equipment harm, or even a characteristic calamity. At the point, when your internet instructional class is on the cloud, the greater part of the data is incorporated and went down remotely. This implies you do not need to stress over losing any of your delicate information.

E. No internal IT support is required

On the off chance that your association selects an introduced eLearning stage arrangement there are numerous things to consider, for example, fabricating a strong IT framework and having committed IT staff to administer the organization. A cloud based eLearning stage, then again, requires no interior IT bolsters at all. Truth be told, a large number of the best cloud based arrangements have IT and client benefit staff who can address any issues that may emerge.

F. Cloud based eLearning platforms are safe

A typical myth in regards to cloud based eLearning stages is that they essentially are not protected. Numerous erroneously trust that the data you store on the cloud is helpless, and that an introduced arrangement can secure your information even more viably. Notwithstanding, cloud arrangements have an assortment of security measures in actuality, from information encryption to SSL. You can even secret word secure certain areas of the eLearning stage to guarantee that just certain people are allowed get to. On the off chance, that there are any endeavored ruptures, the framework will naturally archive the episode and in addition, any appropriate points of interest.

VI. COMPARISON WITH OTHER E-LEARNING MODE

There are following advantages.

Classroom-based training: This conventional work area and seat environment happens in a physical area. It falls under occasion-based learning.

Web-based training (WBT): Any type of training that is accessed via the internet on a computer.

Virtual Instructor-led training: Traditional classroom-based or instructor-led training that is available online, synchronously. It falls under event-based learning. Some people use these above terms interchangeably. In taking the terminology one-step further, there is a recently coined term called cloud-based learning.

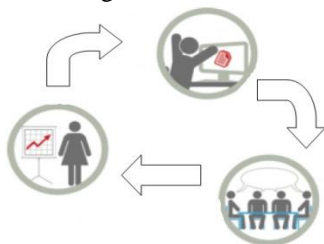


Fig. 4: Classroom to cloud based learning

There are many different types of learning modalities as mentioned above each with its own advantages and disadvantages. This handy chart compares the main modalities across several key features [4].

Table 1: Comparison Table

| Sr. no. | Particular | Classroom based learning | Virtual classroom learning | Cloud based learning |
|---------|--------------------------------|--------------------------|----------------------------|----------------------|
| 1 | Cost efficient | NO | YES | YES |
| 2 | Portable | NO | NO | YES |
| 3 | Variety of learning modalities | NO | NO | YES |
| 4 | Enterprise scalable | NO | NO | YES |
| 5 | Quickly deployed | NO | NO | YES |
| 6 | Auto-managed | NO | NO | YES |

From the Table 1, it has been seen that the cloud-based study is more appropriate for e-Learning. It is better way to provide learning attitude towards the development of nation and society.

VII. VARIOUS CLOUD BASED E-LEARNING MANAGEMENT SYSTEM (E-LMS)

In this part, we will see various cloud based e-Learning Management Systems. The purposes of these systems are used to deal with learning proper attitude concerning systematically and automation of those systems [11].

A. TalentLMS

A super-simple, cloud-based learning stage to prepare your kin and clients. TalentsLMS offers and a free arrangement for up to five clients, 10 courses and 20MB for each document transfer restrain.

B. Docebo SaaS LMS

E-Learning Platform in the Cloud, made simple. Upgrade your business preparing, spare time and spending plan with Docebo. Docebo is highlight rich yet simple to go Online Training apparatus for our Employees. From 5 up to 2,000 dynamic clients: pay as you go! Incorporated with video gathering, HR, CMS, ERP and CRM devices.

C. Litmos LMS

Litmos is a main learning administration framework that both mentors and learners affection to utilize. Litmos LMS lives in the cloud, which makes it simple to make courses and relegate to your learners on any gadget. Litmos has won a few recompenses and is utilized by organizations of all sizes. With more than 1,000,000 clients solid, it is no big surprise that 1,000+ organizations changed to Litmos LMS a year ago alone. Regardless of on the off chance that you are utilizing your LMS for worker, client, consistence or channel preparing, Litmos has an answer fit for your organization.

D. WizIQ LMS

WizIQ's LMS is intended to give teachers, managers, and learners with a powerful, secure, and incorporated framework for making customized internet learning situations. Universities and colleges, secondary schools, and preparing and coaching focuses can utilize the internet learning stage to make and convey self-managed, live online or mixed courses—without the requirement for outsider modules or added expenses to

bolster propelled elements and backing any number of understudies with an adaptable, SaaS-based valuing model. The WizIQ's LMS incorporates course administration; secure video spilling, content sharing, propelled test and evaluation abilities, virtual classroom for live classes, social learning highlights, cloud content library and a great deal more. It utilizes Amazon's inconceivable worldwide framework to guarantee that records can be gotten to and shared from anywhere, whenever—with only a solitary snap.

E. Mindflash Online Training LMS

Mindflash Online Training is a cloud-based LMS where your students can take courses when and where they like, and at their own particular pace. Additionally, you can without much of a stretch make courses, oversee learners, and track results. Nevertheless, does not bolster any eLearning standard like SCORM.

F. Latitude Learning LMS

Latitude Learning is a cloud-based learning administration framework (LMS) for little organizations to worldwide undertakings, which can be redone to your careful details.

G. Haiku LMS

Haiku LMS offers a full suite of apparatuses to help educators instruct, understudies learn, and everyone associate on the web. Haiku LMS is facilitated in the cloud, so it's endlessly versatile!

H. Luminosity LMS

Luminosity LMS is a pay-as-you-go, Cloud based LMS, which underpins eLearning conveyance to the full scope of gadgets and stages including PCs, portable workstations, mobiles and tablets.

I. ScholarLMS

ScholarLMS is a cloud-based, TinCan-empowered Learning Management System taking into account the world's most well-known open source Virtual Learning Environment (VLE). ScholarLMS diminishes innovation boundaries to making and overseeing customary web learning, and gives a simple to utilize SaaS to track and store encounters that have beforehand been extremely hard to record.

J. Joule LMS

Joule LMS is a cloud-based Learning Management System, completely bolstered eLearning arrangement that consolidates open-source Moodle with improvements and administrations to permit organizations to concentrate on educating and learning. Moodle Rooms has been gained by Blackboard.

VIII. CONCLUSION

Cloud computing for e-learning solutions influences the way the e-learning Software projects are managed. There are explicit tasks that deal with finding providers for cloud computing, depending on the needs. In addition, the cost and risk management influences the way the e-learning solutions based on cloud computing are managed. The amount of some public clouds across multiple legal jurisdictions further complicates this subject; these concerns are considered key obstacles to broader acceptance of cloud computing, making them areas of active research, argue among cloud computing practitioners, and advocate. There are many benefits from using the cloud computing for eLearning systems.

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