



Education-As-A-Service

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ABSTRACT:The education system is same but the gaining educational knowledge of students are fully based only on the faculties stuff. So, the variation exists between students knowledge in urban and rural area. To overcome this problem, we propose the solution called 'EDUCATION-AS-A-SERVICE' which can be used in upcoming years because there will be no institutions beyond traditional classrooms. Based on cloud computing, the educational content can be delivering to people at their doorsteps through the EDUCATION-AS-A-SERVICE. It also makes possible the implementation of a Universal curriculum across the nation; enabling students across India acquire the same experience in education. EDUCATION-AS-A-SERVICE empowers the students to learn on their own terms at their own place, wherever and whenever they want it. By using EDUCATION-AS-A-SERVICE learning process is not just limited to textbooks and enhanced through group learning.

KEYWORDS: Cloud, Virtual Classrooms, Virtual Lab, Software as a Service, Platform as a Service.

I. INTRODUCTION

Cloud computing is a nascent business and technology concept with different meanings for different people. For application and IT users, it's IT as a service (ITaaS) is, delivery of computing, storage, and applications over the Internet from centralized data centers [3, 2]. For Internet application developers, it's an Internet-scale software development platform and runtime environment. For infrastructure providers and administrators, it's the massive, distributed data center infrastructure connected by IP networks. In Simple Word, we define the Cloud is the web based computer where we can access the application, store the data and access the data via internet. We use virtualization Technology to realize the Inter cloud architecture because existing cluster resource managers relying on Virtual Environment can give us the building blocks such as availability information required to create virtual Execution environments. In addition, relying on Virtualization technologies has also facilitated the realization of cloud computing services. Cloud computing includes three kinds of Internet-accessible services: software-as-a-service (SaaS), platform-as-a-service (Paas), and infrastructure-as-a-service (IaaS). Here, we consider Paas and IaaS, which aims to avoid high investment and also software installation time and provide computing resources or storage as a service to users.

II. BACKGROUND

2.1 Virtualization

Virtualization is the most profound change that PCs and servers have experienced, said Simon Crosby, chief technology officer for Citrix Systems' Data Center and Cloud Division [1]. "IT departments have long been at the mercy of the technical demands of legacy applications", explained Chris Van Dyke, [3] Microsoft's chief technology strategist for the oil and gas industry. "Now, rather than having to maintain older operating systems because of the needs of a legacy application, IT departments can take advantage of the performance and security gains in a new OS (in one virtual machine) while supporting legacy applications in another. Also, the process of deploying applications becomes simpler, because applications can be virtualized and deployed as a single virtual machine". Virtualization technology lets a single PC or server simultaneously run multiple operating systems or multiple sessions of a single OS. This lets users put numerous applications even those that run on different operating systems on a single PC or server instead of having to host them on separate machines as in the past. The approach is thus becoming a common



way for businesses and individuals to optimize their hardware usage by maximizing the number and kinds of jobs a single CPU can handle.

2.2 Infrastructure as a Service

Today, Many of Cloud Providers offer Services at Various layers of the software stack. At Lower layers, Infrastructure as a Service (IaaS) providers Such as Amazon, Flexi scale and Go Grid allow their Customers to have access to entire Virtual Machines (VMS) hosted by the Provider. IaaS Provide the Whole infrastructure and using this we can able to use the application within the low configuration.

2.3 Software as a Service

The Higher Layers, Software as a Service (SaaS) such as Google Apps, Google docs and Zoho offer complete online applications that can be directly executed by the users. With the help of single email id, we can able to access the service, edit, run and save in the Google docs and Zoho.

2.4 Platform as a Service

The Providers like g.ho.st, eyeos, icloud offer the platform in which the user can access the virtual operating system and that platform consist of all the services that the local OS have the Providers won't offer the compiler and the executable software.

III. RELATED WORK

NIIT launch the first virtual class concept in India, They provide study materials for download, query session via discussion form, video conference i.e., recorded video about subject Students enjoy higher mobility as they can easily access educational services using a Net book or a Mobile device that connects them to NIIT's EDUCATION-AS-A-SERVICE network. These services will be managed by NIIT centrally using the power of Cloud Computing [19].

Most Web OSs, such as eyeOS and Desktop two, feature APIs that let programmers write new programs for the operating system. Sapotek sponsors the Sapodesk open source software community. About 50 projects are under way to develop desktop-like customer-relationship-management, calculator, and other Web-based applications, including those that work with the company's two Web OSs, noted Sapotek CEO Joshua Rand[2]. Some Web OSs, such as the SGD, deploy standard Windows or Unix applications online via servers that run the programs in virtual machines that handle them as if they were in their native OS.

1) G.ho.st works with various Web applications already on the Internet, such as Zoho for word-processing, spreadsheet, presentation, and other office-productivity functions.

2) Zimbra for calendaring and messaging; Pandora for playing music; and Flickr for displaying and managing photos, noted G.ho.st CEO Zvi Schreiber[1].

3) The Burton Group's Creese said Microsoft's release of Silver light—a cross-browser, cross-platform plug-in that allows development of rich Web applications—could encourage the many programmers familiar with Microsoft-based development tools to also begin creating software for Web OSs.

Web OSs generally comes with a limited number of applications. And, the Burton Group's Creese said, the applications might not have features that users like in their traditional programs. Also, users may be too unfamiliar with the software to want to use it.

IV. PROPOSED WORK

4.1 Considerations

As stated earlier, EDUCATION-AS-A-SERVICE has the features of traditional College like classes and lab. But the environment is beyond the relationship among students and mentors in traditional. In our traditional College there is some digital gap among the students in rural and urban areas. In urban, the students who are studying engineering or



technical oriented courses they update their knowledge in colleges or in many ways. Because they had lots and lots of opportunity to upgrade their technical skills. But in rural areas students are not aware about day to day technical development and most of the colleges are beyond the basic technical facility. Using the considerations of these we proposed a virtual Class. Virtual class have the functionality as following, course enrollment, registration, resource material for download, video conference denotes offline virtual class here pre-recorded videos are available like video tutorial and Live Streaming denotes Online virtual class, it is fully based on the live teaching via web cam, there is an interaction among both students and mentors. Query session for clarify students doubts Virtual lab has the features and functionality of traditional desktop operating system. However, Virtual lab typically transfers applications to web server where user can manage his resources through virtual desktop using web browser. At the start of our research we had three main interests which we tried to satisfy.

- 1) Moving from fully personalized familiar desktop on PC to a virtual Lab for the academic institution, is a hard task, as Students will accept nothing less than traditional desktop which they have been adopt for the local desktop. Thus, user data, preferences as well as sessions must be maintained Ensuring that user will always has a personal experience that resembles his fully personalized traditional pc environment.
- 2) Semantic web technology plays a significant role in today's web as well as desktop systems. That's why we thought that it was only a matter of time before semantic web techniques thrust in the research of web based lab and operating system.
- 3) A service-oriented architecture (SOA) is seen as the next Evolutionary step in building web-based applications as it provides a set of principles of governing concepts used during phases of systems development. As in n-tier architectures SOA separates presentation /applications, services and data into layers preventing dependency between layers [8, 9, and 10].

Using the considerations of these we proposed a virtual lab. This virtual lab includes compiler, Database tools, and the internet applications.

4.2 Architecture of our Education-As-A-Service

In our proposed system, we split the modules into three Managements are as follows,

- User Management
- Resource management
- Database Management

4.2.1 User Management

In User Management Layer, interaction between the Student and the Mentor is maintained. Some of its functions include the Course enrollment, creation of new users in the system, listing of all users, delete users, Video conference(virtual class-offline),Live streaming (Virtual class-online)making interaction between the application and the user etc. There are three main components in this layer. They are Interfaces, Logs and files and Sessions. An interface manages the implementation of the remaining components that form the “engine” like structure. In our project AJAX plays the role of engine and using the AJAX Engine the web applications can retrieve data from the server asynchronously in the background without interfering with the display and behavior of the existing page.

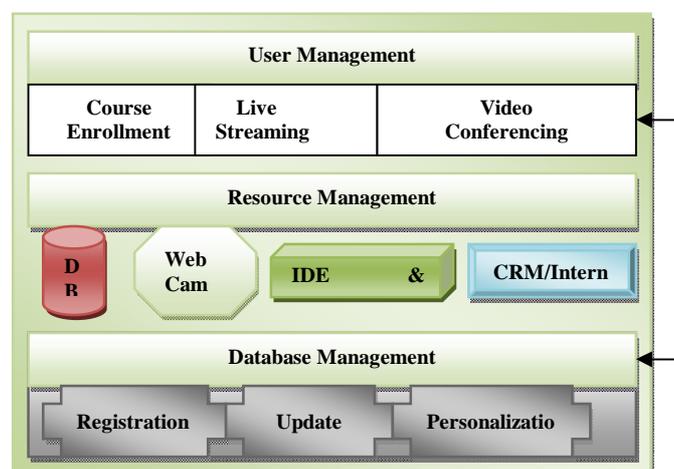


Fig 4.1 Architecture of EAAS



4.2.2 Resource Management

There are various resources which include database, compilers. These resources are managed by this resource management layer. Using these resources a student can able to develop the programs, share it, edit and run there without the local installation.

4.2.3 Database Management

In this layer, all the data are managed. The data includes user (both students and mentors) details, Schedule details, resource details, session details, interaction details. Authorization is provided as we are managing the user details. The database is updated in each session and personalization also managed

V. TECHNICAL LAYOUT

In EDUCATION-AS-A-SERVICE we include all the sessions with video chatting. Student as well as mentor can able to access the resource at high mobility. The virtual lab is mainly design using the embedding application over the WebTop. A web desktop or WebTop is a desktop environment embedded in a web browser or similar client application [12]. A WebTop integrates web applications, web services, client-server applications, application servers, and applications on the local client into a desktop environment using the desktop metaphor. Web desktops provide an environment similar to that of Windows, Mac, or a graphical user interface on UNIX and Linux systems. It is a virtual desktop running in a web browser. In a WebTop the applications, data, files, configuration, settings, and access privileges reside remotely over the network. Much of the computing takes place remotely. The browser is primarily used for display and input purposes. This was achieved by using the PHP, XML and Java Script (in short AJAX is used to mounting and made communication between client and server).

Ajax Engine acts as a microkernel and the interaction between the client and the cloud. Each core part of the desktop is its own application, using JavaScript to send server commands as the user interacts. As actions are performed using Ajax (such as launching an application), it sends event information to the server. The server then sends back tasks for the client to do in XML format, such as drawing a widget [9, 13]. On the server, Virtual lab uses XML files to store information. This makes it simple for a user to set up on the server, as it requires zero configurations other than the account information for the first user, making it simple to deploy. To avoid bottlenecks that flat files present, each user's information and settings are stored in different files, preventing resource starvation. We provide various types of applications in this Virtual lab such as CCWebSql, Cloud OfficePackage.

i) CCWebSql - CCWebSql Created as a simple replacement for desktop mysql client applications, and to assist staffs and students of mysql for doing queries on their database using a simple interface.

ii) CloudOfficePackage – COP created as a simple replacement for desktop office packages and to assist students and mentors for doing the project and usual work.

VI. RESULTS

In this, the screenshots of our project is captured and listed below. It consists of,

- Login Page
- Virtual Class
- Virtual lab
- CC WebSql
- CloudOfficePackage

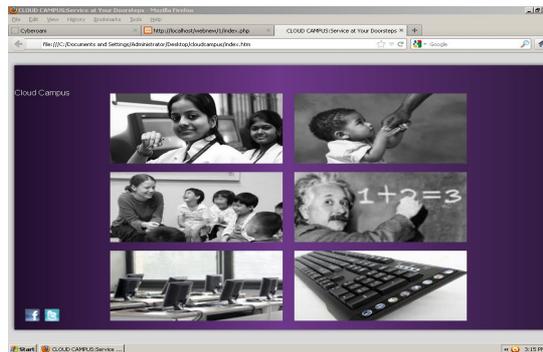


Fig 6.1 Front Page



Fig 6.2 Student Login

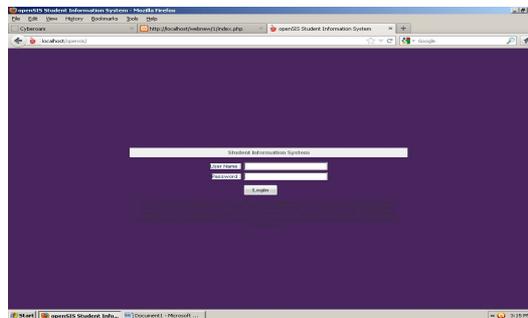


Fig 6.3 Virtual Class.



Fig 6.4 Virtual Lab

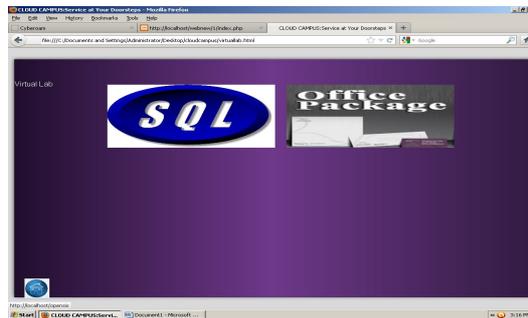


Fig 6.5 Packages for Lab

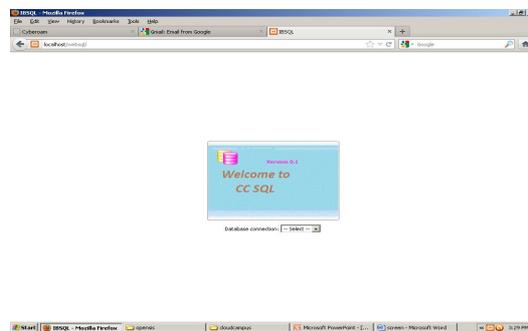


Fig 6.6 Front Page for CCSQL

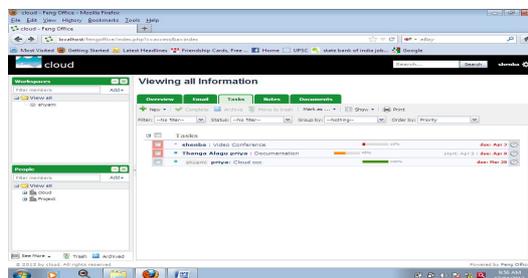


Fig 6.7 Cloud Office Package

VII. CONCLUSIONS AND FUTURE WORK

In this paper, we present the ideas of the unbiased education through Virtual Class and Virtual Lab. The implementation methodology of the virtual lab using the web based operating system. And introduce some of the engines that act as the kernel structure to perform the application over it. The only problem with this virtual lab is the bandwidth and hopes the 3G and 4G introduction equate that pitfall. Due to the analysis, we inferred that hardware also plays a main role for the demonstration cost. Although there is a long and varied history of distance education, the current intersection of technology as a means to facilitate real-time communication with community-centred interaction, and the increasing acceptance and employment of those developments in the broader culture, have uniquely positioned virtual class in a position of significant innovation and responsibility. Students are encouraged to interact with peers through web-conferencing technologies. Small-group and whole-group collaboration is a suggested platform for virtual education. If we go with the hardware less infrastructure, we will compensate the digital gap araised between urban and rural area students and achieve the economical lab setup and that may be the future work that we proposed here.



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