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Cloud Setup for College Campus with Data Security and Reliability

Computer Science

KEYWORDS : Cloud computing; SOAP; IIS server ;Web Services; Intranet ; IdM .

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ABSTRACT

Cloud computing paradigm has emerged as a very effective tool since it allows the dynamically scalable resources to be provisioned according to the user needs. Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., users, networks, servers, storage, applications, and services) that can be rapidly serviced. In our project we have attempted to provide a cloud storage to store, upload and manipulate necessary data for the teachers and students as well, in our college. Also, we have tried to maintain some of the main characteristics of cloud services such as performance and reliability, and the data security and efficient accessibility. These characteristics are being portrayed by using applications such as maintenance of attendance records, notification provisions for teachers as well as principal and feedback provisions as well as online test availability for students. The designed cloud storage (Drive) is used within Intranet by using LAN connection. The Drive facilitates users with a separate and limited space to store and upload data and also the privileges of On-Demand services. The platform used to implement this idea is Windows XP.

II. INTRODUCTION:-

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. Cloud Computing is a style of computing which must cater following variety of characteristics:

- Shared Infrastructure
- Dynamic Provisioning
- Network Access

Cloud provides various types of services, some of the important services are SaaS, IaaS and PaaS.

A) *Software as a Service (SaaS):-*

It is software deployment model in which application are deployed remotely on the server by the Cloud service provider and those services can be used by the cloud users.Gmail is a popular SaaS solution.

B) *Infrastructure as a Service (Iaas):-*

Infrastructure as a service is a provision model in which an organization outsources the equipment used to support operations, including storage, hardware, servers and networking components. This is the base layer of the cloud stack. It serves as a foundation for the other two layers, for their execution. The whole cloud infrastructure viz. Servers, routers, hardware based load balancing, firewalls, storage and other network equipments are provided by the Iaas provider.

C) *Platform as a Service (PaaS):-*

Platform as a service (PaaS) is a way to rent hardware, operating system, storage and network capacity over the internet. User can access the platforms, enabling them to deploy their own software and applications in cloud. Platform as a service (PaaS) is an outgrowth of software as a service (SaaS) , a software distribution model in which hosted software applications are made available to customer over the internet.

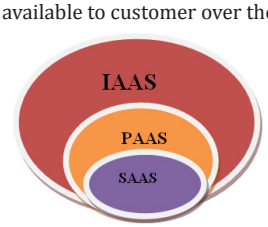

FIG 1: SERVICES OF CLOUD

III. FEATURES

The main features which we are providing to give the cloud setup an upper hand from the existing system are as follows:

A) Accessibility:-

Data accessibility is an important part as it makes all the data, accessible to the cloud user from different areas. This will also reduce the time which is taken for accessing any data from the college records and will also make it less tiresome. To make more efficient use of time, our project allows multiple users to share both the physical access to the computer from multiple terminals as well as to share the CPU time.

B) Security:-

One of the main purpose of creating a cloud setup is to provide an effective data security. By providing data security proper data accessibility and maintenance of data can be done. In our project we are going to provide data security by providing encryptions and decryptions to maintain the security .Also we are providing data security using the concept of IDM (Identity Dynamic Management) .So here we will be

providing a dynamic privacy-enhanced federated identity management solution for preserving the user's privacy and also the data stored in clouds` database.

C) *Reliability:-*

It's a another feature that we are providing. As the users can use multiple Services on cloud at a same time so at this condition our database usage continuity and in any case some error occurs then disaster recovery is provided which hence assures the data reliability in our project.

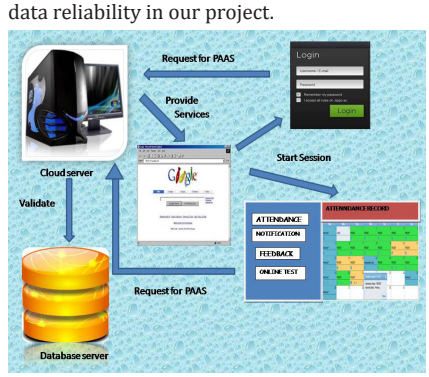

Fig2: Basic Idea Of Implementation

IV. PHYSICAL SETUP OF CLOUD:-

The main requirements for cloud setup for college campus are:

1) *Two servers:* Server 1 i.e. Cloud server
   Server 2 i.e. Data server
2) *Multiple Clients:* Users

User will be communicates with server 1 which is cloud server with the help of public switch. The server 1 and server 2 will communicate with each other using private switch. Here the actions that has to be performed by the users are being done by first accessing the cloud server than the respective task is allowed to be performed on or using the database server after getting authenticated or validated by the cloud server.

V. DESIGN FEATURES FOR OUR COLLEGE CLOUD SETUP:-

- Basically in our existing system of colleges all the data is being maintained manually on paper , like attendance record , notifications , feedbacks and also tests due to which data tampering is often occuring. Thus by setting up the cloud in our college this problem can be solved as it will be providing data security ,reliability as well as secure accessibility.
- College contains various departments like Computer Science, Information Technology, Electronics and Telecommunication etc. and also many number of classes and labs. So it is often a case that whenever a new software and platforms are purchased it has to be installed at every device separately so by using our drive we only need to install it only once which will be stored on cloud server..
- Each cloud user will be assigned a unique-id for login purpose which will help in maintaining security.
- First of all the user`s id and password will be taken then after validation and authentication the access to the cloud will be granted then further database usage on cloud can be done after all security measures are taken by the cloud.

VI. PROJECT MODULES

There are various modules that we are gonna implement in oue project and their information as follows:-

Module1: Login and Registration

User needs to register first. After register that request is sent to the principal for approve account. Once it get approve principal users (teacher or student) can login into system.

Here the user ID and password will be provided and then the authentication and validation of the same will be done .So as to provide access to cloud server. Open to all the users i.e staff and students.

Module2. Notifications

If any staff member wants to share some data with students as well as other staff members then they can use the notification system to notify them . Here the manipulation with database can be done by only staff members that means uploading of any kind of notification can be only done by staff members. Students will get the notifications about it and also will be given the provisions of downloading data if any.

Module3.Feedback

If students wants to share some data other students or faculty members ,then can notify over here so that other students and faculty members get the information uploaded. Here the provision of uploading is given only to students.

Module4. Online Exam System

In this, students can give test online. It is divided into two parts one will be mock tests and second will be main exam. Mock tests will be available for 24 hours but main exam will be available for particular time period only.Here the access will be given to staff members only.

Module5. Attendance System

In this teacher can fill the attendance of student and base on attendance defaulter list is generated. Defaulter list will be displayed to the students but can only be manipulated by teachers.

VIII. REQUIREMENTS:-

A) *Software Requirements:-*

- Windows XP
- Visual Studio 2010
- Microsoft .Net framework 3.5
- Microsoft SQL server 2008
- Internet Information Services

B) *Hardware Requirements:-*

Elements	Server 1	Server 2	Clients
CPU	Dual core() Or with Processor with 1.83 GHz	Intel Core i3 (2.27 GHz) 0r Processor with 1.83 GHz	Intel Core i3 (2.27 GHz) 0r Processor with 1.83 GHz
Memory	4 GB RAM or more	4 GB RAM or more	2 GB RAM or more
Disk	5400rpm	5400 rpm	5400 rpm
Disk Space	40 GB	40 GB	30 GB
Networking	100Mbps	100Mbps	100Mbps

Table1. Hardware Requirements for cloud setup.

X. PRE-REQUISITE FOR SETTING UP CLOUD

These following are required for the installation of cloud using windows XP:

A) *IIS server*:

IIS (Internet Information Server) is a group of Internet servers (including a Web or Hypertext Transfer Protocol server and a File Transfer Protocol server) with additional capabilities for Microsoft's Windows NT and Windows 2000 Server operating systems. IIS is Microsoft's entry to compete in the Internet server market that is also addressed by Apache, Sun Microsystems, O'Reilly, and others. With IIS, Microsoft includes a set of programs for building and administering Web sites, a search engine, and support for writing Web-based applications that access databases. Microsoft points out that IIS is tightly integrated with the Windows NT and 2000 Servers in a number of ways, resulting in faster Web page serving.

B) *Web Services*:

A **web service** is a method of communication between two electronic devices over the World Wide Web. A **web service** is a software function provided at a network address over the web or the cloud; it is a service that is "always on" as in the concept of utility computing. The W3C defines a "Web service" as a software system designed to support interoperable machine-to-machine interaction over a network. It has an interface described in a machine-processable format (specifically WSDL). Other systems interact with the Web service in a manner prescribed by its description usingSOAP messages, typically conveyed using HTTP with an XML serialization in conjunction with other Web-related standards.

C) *SOAP:*

SOAP is originally defined as **Simple Object Access Protocol**, is a protocol specification for exchanging structured information in the implementation of Web Services in computer networks. It relies on XML Information Set for its message format, and usually relies on other Application Layer protocols, most notably Hypertext Transfer Protocol (HTTP) or Simple Mail Transfer Protocol(SMTP), for message negotiation and transmission.

XI. INSTALLATION

Tto install Cloud Infrastructure in Microsoft Windows XP the rules and regulations has already been specified for installation .So ,Windows XP Cloud Infrastructure with IIS and web services is our recommended method .

Windows XP Cloud Infrastructures with IIS and WebServices:

This install is done in three steps:

1. Install the IIS server
2. Create Web Services.
3. Deploy Web Services using IIS for the installation of cloud

C. Installing the IIS server

1. Install IIS server

2. Creation of file -> "c inetpub wwroot"

Note: The minimum recommended number of machines is 3.

D. Install Web Services:

1. This can be done on the same server you have deployed IIS onto.
2. Create a configuration file
3.. Deploy Web Services by add this file in "c inetpub wwroot" .

XII. FUTURE SCOPE

Additional platform and IAS can be included in cloud for the benefit of the students. Software must be updated with new version. More features must be added with advance security measures. This cloud infrastructure helps organization for upgrading their facilities and adding new features to all users of it. It will reduce the hardware cost.

XIII. CONCLUSION

Cloud Computing is becoming part of everyday life for users, in a way that is mainly transparent to them. Cloud provides a very flexible environment for data accessibility. In this paper we have described some of the main characteristics of cloud setup such data security ,reliability and accessibility by providing different applications. Moreover, a set of tests will be executed to obtain experimental results to evaluate the behaviour and performance of our cloud setup for college. This paper briefly explains the set up of a private cloud in a cluster based environment using open source technologies like IIS,Microsoft SQL Server, Visual Studio, SOAP. The current implementation of this paper provides Platform as a service (PaaS) and Infrastructure as a Service (IaaS).

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