APPLICATION OF CLOUD COMPUTING IN ACADEMIC INSTITUTION

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Abstract— Cloud computing is a web-based service. It is shared pool of resources over the internet. Cloud is not any single entity but set cloud services, cloud storage, cloud infrastructure and cloud platforms. This paper aims to describe use of cloud computing for online compiler providing portability and storage. By making use of online compiler developer can select the one which is convenient and gives fastest compilation result. This web-based application is platform independent and can be remotely accessed by network connection. This application is helpful for conducting online practical examination because of it reduces work of installing compilers on every system in lab. Intern reduces lab administration workload. Hence the system provides centralized storage and centralized compiling scheme.

Keywords— academic institution, cloud computing, online compiler

I. INTRODUCTION

Cloud computing provides the most efficient and adoptable technology now a days because of its advantages over the client server technology. Cloud Computing refers to application and services that run on a distributed network using virtualized resources and accessed by common internet protocols and networking standards. Cloud is on demand service where user simply requests for a resource he is willing to use for a particular period of time and then may release. Resources can be any software, hardware, platform required. It provides great flexibility to end user by simplifying their work, also economically beneficial. Two different classes of clouds: those based on deployment model and those based on service model. The deployment model tells you where the cloud is located and for what purpose. Public, private, community and hybrid clouds are deployment models. Service models describes the type of service that service provider is offering. Best known service models are Software as a service, platform as a service, and infrastructure as a service.

A. SAAS:

Software requirements of clients are fulfilled with SAAS. Client can use software they need without installing on a personal system.

B. PAAS:

Platform required for developing certain application is also provided on cloud with PAAS. Client gets specific platform like Linux OS or any other that they need for developing particular application.

C. IAAS:

Hardware requirements are fulfilled with the IAAS. Client can demand for hardware configuration they required, in their application for some period of time can get from cloud.

There are mainly three types of cloud for servicing different users:

1. Public cloud: Public cloud can be setup within premises or out somewhere. Person from the same organization or different can access the services from public cloud.
2. Private cloud: Private cloud setup establish within the premises only. Admin by the organization person and services of private cloud can be access by authorized nodes only.
3. Hybrid cloud: Hybrid cloud is the combination of both private as well as public cloud.

II. NEED FOR PROJECT

With cloud computing is that client is unaware from where he gets service and where the server is located. The main advantage of cloud computing is fastest processing Thus, keeping this main advantage in mind, the main reason for creating the project is to provide a centralized compiling scheme for organizations or institutions. Also, it will act as a centralized repository for all the codes written. The other major advantage that this system will have over the others is that it will make the users system lightweight i.e. there will be no need to maintain separate compilers/SDK’s client-side. Thus, for educational institutions this will prove to be highly
efficient. Also, the process of maintenance and distribution of dynamic usernames and passwords will be greatly simplified. Also, authentication and personalized task distribution will be made possible. Lab administration gets easy and lab maintenance problem can be easily avoided. Educational institutions this will prove to be highly efficient. Also, the process of maintenance and distribution of dynamic usernames and passwords will be greatly simplified. Also, authentication and personalized task distribution will be made possible.

### III. ONLINE COMPILER

![Online Compiler Architecture](image)

To facilitate online compiling client has given primary functions which need to execute by client to execute their code:

1. **Start option**: Where editor is open and user can start writing code which the send to server for compilation.
2. **Compile code**: After code has been written it is now ready to compile. With the click for compile button code will get compiled and displays result whether successful or not.
3. **Execute code**: With the execute button compiled code which is error-free get executed and results are displayed to client.

All the programs with the timing of compilation are stored in database maintained by the server. Administrator can watch all the movements of the client. Online compiler is a simple compilation tool which compiles and executes code for user. The code written on client window is taken by online compiler and executable file is stored in database. URL provided by online compiler will helps to download and access .exe file directly on user’s terminal. This feature will lead to server interact and be safe from damage.

**Deployment of private cloud using Glassfish**:

Private cloud is known as corporate cloud. It provides service to limited number of people who are registered. We are developing private cloud with glassfish server and we will deploy our online commuting model on that. Each user will be given a registration id and then all the services are accessible to him. He can create, store, execute his/her application on a server. Private cloud which is also known as internal cloud which marketing of computing resources that provides hosted services to a limited number of people. With the help of distributed computing and virtualization technique, data centre administrators and other corporate network to effectively become a service provider that meets the needs of their customers.

### IV. ARCHITECTURE

Online compiling system is layered architecture. First layer contains clients, with any manageable configuration or we can say any thin client. And other layer is server, where actually our online compiling module runs. And where cloud server is located. So every user account is created on cloud and database is managed for that.

![Online Compiler Architecture](image)

Architecture is developed and workout as follows:

1. To provide a centralized compiling scheme for an organization or institution.
2. Centralized storage for all the codes written.
3. No need to maintain separate compilers or SDK’s at client side.
4. User authentication and personalized task distribution. That is the administrator will be able to assign user-id, password & personalized tasks to all the clients.
5. The codes will be compiled centrally and the results will be displayed at client-side application.
6. Both the error stream and output stream of the compiler will be captured and the output will be sent to client.
7. Web services are used for communication between client and server.
8. Glassfish is a web server used.
9. A database of all the codes written by the clients will be maintained.
10. A client may retrieve the stored-code at any later instance.
11. The administrator will have full authority to compile & execute the codes stored by clients for evaluation.
12. Statistical details of compilation time, execution time, etc. will be maintained at the server side.
13. Extremely efficient for educational institutions since maintenance of compilers needs to be done at only server side.
14. Direct comparison of outputs of all the clients can be done at the server side.
15. A client may be assigned a different task every time he/she logs in depending on the will of the administrator.
16. A client may be assigned a different task every time he/she logs in depending on the will of the administrator.
17. Efficient for conducting practical examinations, since every client will be assigned a different log in id and password.
18. The administrator may create, edit and delete client profiles anytime.

This is how workflow of the system goes:
1. Sin in: This module accepts the details of a new user and stores it in the database. This module ensures that the user is registered before the first login.
2. Sin up: A registered user should login with his username and password. This module facilitates login and user authentication using
3. User Details DB database. This action is logged in the
4. Logs database.
5. Select Language: In this step user will select the language in which he want to code and compile.
6. Edit code: - Editing of a complete code will be done here. Code typing, updating, and all editing functions will be performed in this editing area. After editing user send that code for compiling.
7. Compile request: - This module will compile the code and displays result. Errors are displayed in case if present any. This module works when it gets the request from client.
8. Request send: - This stage will send the request from client to server using SOAP/XML protocol.
9. Request receive: - Request is received by the server, then server will handle that request. It processes the request and store in database.
10. Compiler interface: - This compiler interface module contains compiler respiratory, where all compilers are stored
11. Compiler output: - Compiler generates output. If compiled correctly or errors are present, and displays them correspondingly for further processing.
12. Response: - This compiled output should reach to the client this is nothing but response to the client from server.
13. View compiled response: - Here compiled response is viewed by the client. This may be any kind of errors, message of compilation or result of execution.

The timing and response of all the above processes are stored and maintained in the database. And handle by the cloud server.

V. IMPLEMENTATION

In this project development, the three important aspects need to be emphasized are java programming language, MySQL, and Glassfish server. The software that has been used in this project is java, MySQL, Glassfish is used to. It provides the web service to interact between client and server on network. MySQL is used as storage information system.

Step 1: Implementation of cloud from server (cloud server)

![Fig. 4. Snapshot of cloud server](image-url)
Step 2: Give name for project.

Step 3: Select Glassfish Server.

Step 4: Structure of a project will be created.

Step 5: Right Click on default package and select New -> Java Package.

Step 6: Give name to the package.

Step 7: Create a Web Service.

Step 16: Web Service reference will be added.

Step 17: Drop a web service reference in code.

Step 18: Structure of a function will be automatically created in your code.

Step 19: With the GUI support we run our application.
Step 20: Finally we have successfully created our module on cloud.

Advantages
1. No need to download the SDK of any Compiler: When we want to execute any program we required a software.
2. Development kit of that particular program for example if user want to compile JAVA program then they required JDK.
3. No issues of setting path variables: Sometimes there is requirement of setting path variable i.e. where the program is saved.
4. Simple to use GUI for better coding: It provide better graphic user interface for coding i.e. editor.
5. Mobility: No need to carry whole environment of our program. Internet connection on user system is only requirement.
6. No need of storage space on your system: Everything is store on web server so there is no need of storage space of user system.

Disadvantage
1. Cost is high because of Cloud Server.
2. Required Internet Connection.

CONCLUSION
By integrating and enhancing the capabilities of these essential technologies, we hope to introduce the ‘Online Compiler’ and to contribute to the current examination system.

It would basically be a platform for students of the university to give their practical examinations online. There would be a cloud where there will be a server which would have the power to compile the student’s code stored on another machine.

As compared to the current scenario where each machine should have the C/C++ compiler installed separately and an examiner has to visit each machine to check each and every student’s code. This would eliminate the need to install compilers separately, the examiner does not need to visit each student but can check the codes at the centralized server as well as each students record is maintained for future references. Another advantage of such a project is that whenever the compiler package is to be upgraded it can be done easily without again installing it on each and every machine.

REFERENCES