SMART LAB USING SAAS TECHNOLOGY

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Abstract: Smart Lab is an application which is designed while considering the requirements of organizations and industries. It can also be used in institutions for conducting examinations. The idea used in smart lab is that there is an online compiler which reduces the issues of storage space, time, cost, portability. Online compiler uses the technology of cloud computing i.e. SaaS. A database of all the codes written by the clients will be maintained. A client may retrieve the stored-code at any later instance. There is no need to maintain the separate compilers at the client side. The codes will be compiled centrally and the results will be displayed at the client side. Both the error stream and output stream of the compiler will be captured and the output will be sent to client. Hence the trouble of installing the compilers on each computer is avoided. Client is not aware of the physical location of the server.

Keywords- Compiler, Centralized compiler, Online-compiler, SaaS.

I. INTRODUCTION

Cloud computing is a type of distributed computing where ‘n’ number of applications can be hosted. Client server is a kind of application architecture and the cloud computing is a kind of distributed computing. Cloud computing actually means storing data at the other location usually operated by the third party. Online compiler uses the technology of cloud computing such as SaaS. There are 3 cloud computing technologies i.e.

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

IaaS (Infrastructure as a service): IaaS is sometimes referred as Hardware as a Service(HaaS). It is a model in which the vendor provides the infrastructure such as network, storage, compute resources and virtualization technologies on rently basis. The advantage is that we get the virtual servers with own choice of configuration and operating environment so one can deploy applications and services without requiring investment in expensive hardware and maintenance contracts.

PaaS(Platform as a service): PaaS is a middleware between IaaS and SaaS. It delivers computational resources through a platforms. It makes the application development, testing and deployment quick, simple, cost effective. It is highly scalable. The user need not have to worry about platform upgrades or having their site go down during maintenance. It is a model in which hosted software applications are made available to the customers over the internet. Application developers do not have to invest in physical infrastructure.

SaaS(Software as a service): It is sometimes referred to as “on-demand software” or hosted software. It is a model in which software and associated data are centrally hosted on the cloud. It is a way of delivering applications over the internet as a service. It reduces the problem of installing and maintaining software, provides easy access via internet. SaaS applications does not require any downloads or installations. It can be run directly from the web browser. It removes the overhead of installing and running applications on individual computer.

Online compiler reduces the costs, providing better computing facilities, better security, faster processing. It makes the system light weight i.e. there will be no need to maintain separate compiler’s at the client side. The tasks will be managed by the admin who will have the complete authority over the software. It is platform independent. The admin can create, delete and modify the client profiles. This project is completely efficient for the educational institutions since maintenance of compilers needs to be done at the server side. Statistical details of compilation time, execution time etc will be maintained at the server side. Direct comparison of the codes of all clients can be done at server side. A client may retrieve the stored-code at any later instance.

In existing system, it is a very hectic job to install compilers on each and every computer. It is very time consuming process and also hectic job for an administrator of an organization.

In proposed system different compilers are installed at server. Programs are compiled at server side and results are passed at client side. Authentication and authorization is handled by an administrator. The system will be flexible in case in future if there is any need to install compiler which is not present on server side then the original copy of the compiler would be installed on server.
The additional features such as:
1. Task allocation.
2. Block applications
3. Snippets
4. Email or SMS broadcasting.

**Task allocation:** Administrator will provide specific task to the client such as Fibonacci series, factorial etc.

**Block application:** Internet explorer or chrome would be blocked if the student is performing any illegal activity such as downloading the code from the internet.

**Snippets:** If administrator assigns a task of Fibonacci series to the client the output of that Fibonacci series will be supplied as input to the client for another program. Snippets are called as common shared code which are of two types:
   a. Static snippets.
   b. Dynamic snippets.

**Email broadcasting:** Administrator will broadcast email or messages to all the clients.

### II. PROJECT IMPLEMENTATION

The project will consists of three modules:

a. **Admin:** User authentication and personalized task distribution i.e. the administrator will be able to assign user-id, password and personalized task to all the clients. Database of all codes written at the client side will be maintained by an admin. Admin will have full authority to compile and execute the codes stored by clients for evaluation. Admin may create, edit and delete client profiles anytime. The software will be managed by the administrator who will have the ultimate authority over the software.

b. **Client:** Client can login, write code, download code, upload code, demand compile code, demand execute code, save and load code, logout. Codes will be compiled centrally and the results will be displayed at client-side application. Both the error stream and the output stream of the compiler will be captured and output will be send to the client.

c. **Server:** Servers are on-demand virtual machines engineered to deliver performance and reliability. Statistical details of compilation time, execution time, etc. will be maintained at server side. Different types of compilers will be installed at the server side. Direct comparisons of output of all the clients can be done at the server side. Servers will manage database, manage the compilers, manage versions, compiles code, execute code, send results, view logs, exit.

### III. ARCHITECTURE DIAGRAM

Smart Lab Using SAAS Technology

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Fig.1 Smart Lab
IV. MATHEMATICAL MODEL

Let system be 
R={U,S,C,Cd} 
Where 
U=Set of users {U1,U2,U3,...Un} 
S=Set of services{S1,S2,S3,…Sn} 
C=Set of compilers{C,C++,Java etc} 
Cd=Set of code{C1,C2,C3,…Cn} 
The main aim of the project is to provide the 
centralized scheme. 
Consider the system as below: 
If (login)={Uid, SHA (password)} 
p=SHA {password} 
If (signup)={Uid, password, fullname, address, 
email, contact} 
Password= SHA (password); 
If  (addcode) = {Uid,C,L} 
Where 
L->List of languages 
C->Set of compilers 
If (execute code)= {Uid,I,L} 
Where 
I->Set of Interpreters 
L->List of languages 
If (admin)= {A,Uid,password} 
A->Authorised user 
If (compile) ={C1,Cd,L} 
C1->Compiler 
Cd->Code 

CONCLUSION

Smart lab is an application which is designed while 
considering the requirements of the institutions and 
organizations. Smart lab makes student familiar with 
compiler optimization techniques rather than to wrap 
compilers. Its main advantage is to provide 
centralized compiling scheme and to have storage for 
all codes written. User authentication and 
personalized task distribution i.e. the administrator 
will be able to assign user-id, password and tasks to 
all the clients. Statistical details of compilation and execution time 
will be maintained at the server side. The advantage 
is that whenever the compiler package is to be 
upgraded it can be easily without again installing it 
on each and every machine. Different compilers 
allow the programmer to pick up the fastest or the 
most convenient tool to compile the code and remove 
errors.

FUTURE SCOPE

Whenever the compiler package is to be upgraded it 
can be done easily without again installing it on each 
and every machine. In order to provide extra security 
the code can be encrypted and decrypted. It can also 
be done through mobile phones using an android 
application. It can be used as centralized database 

REFERENCES

Implementations” - ITI 2008 - 30th International 
Conference Information Technology Interfaces 
[2]. Sweet, W. and Geppert, L., “http:// It has changed everything, 
especially our engineering thinking.” IEEE Spectrum, 
[3]. Camposano, R.; Deering, S.; DeMicheli, G.; Mackov, L.; 
Mastellone, M.; Newton, A.R.; Rabaey, J.; Rowson, J.; 
“What’s ahead for Design on the Web”, IEEE Spectrum, 
[4]. Hank Shiffman, Making Sense of Java, 
http://www.disordered.org/java-QA.html 
[5]. Hank Shiffman, Boosting Java Performance: Native Code and 
[6]. Gundavaram, S... CGI Programming on the World Wide 
[7]. Wall, L., Christiansen, T., Schwartz, R.L. Programming Perl, 
[8]. Shufen Zhang Shuai Zhang Xuebin Chen Shangzhuo 
“Analysis and Research of Cloud Computing System 
Instance”, Future Networks, 2010. ICFN ’10. Second 
International Conference 
[9]. Shuai Zhang Shufen Zhang Xuebin Chen Xiuzhen Huo, 
“Cloud Computing Research and Development Trend”, 
Future Networks, 2010. ICFN’10. Second International 
Conference 
[10]. Grobauer, B. Walloschek, T. Stocker, E,“Understanding 
Cloud Computing Vulnerabilities”, Security & Privacy, 
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