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Implementation of Cloud Based Compiler

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ABSTRACT- Installing compilers in every system in labs is very hectic job. It is very difficult to maintain PCs by lab administrator. It is also very difficult to conduct lab session by faculty members. In the existing system IDE is implemented but there is need of installing compilers in every system in labs is very hectic job. It is very time consuming process. It has the problem of storage space. In proposed system we use SaaS Technology removes the overhead of installing and running applications on individual computer. Programs are compiled at server side and results are passed at client side. Administrator can view the client task. Authentication and authorization is handled by an administrator. Every client is assigned a unique id and password. The administrator may create, edit and delete client profiles anytime. A database of all the codes written by the clients will be maintained. User authentication and personalized task distribution administrator will be able to assign user-id, password personalized tasks to all the clients. The administrator may create, edit and delete client problems anytime. In that we are providing feature of package installation. We are also providing facility of updating IDE whenever new feature will get added.

KEYWORDS:- Online compiler, Compiler, SaaS (Software as a service), Cloud Computing, Centralized Compiler

I. INTRODUCTION

Cloud computing model is for enabling convenient as well as a network access to a Shared pool of configurable computing resources. In this internet world all the things are online. Here we use an online compiler. This project's main aim is, we can easily write Program, compile and debug it in online. In this project, we have three online compilers namely, Online CSS, HTML and JavaScript. Different programming languages are being compiled using cloud computing, which is portable and reduces the storage space, online compiler using cloud computing, which provides most convenient tool to compile code and remove the errors. These three compilers provide online compiler service, so no need to install separate compiler on each PC.

By using all these application we can conduct online practical examination and many other applications too. Cloud computing is a type of distributed computing where a number of applications can be hosted. It actually means storing data at the other location usually operated by the third party. Client server is a kind of application architecture and the cloud computing is a kind of distributed computing. In client server the version of both client and server should be same and both should be connected. Cloud computing provides computation, software, data retrieve and storage services that do not require the end user knowledge and the physical location of the system. It also has the ability to run a program or applications on many connected computers at the same time IDE development using SAAS technology 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 IDE development is that there is an 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 compilers at the client side. The tasks will be managed by the admin who will have the complete authority over the software. It is not dependent on platform. The admin can create, delete and modify the client profiles. This project is completely e-client 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. It uses the technology Now-a-days, requirement for executing the practical is compilers and the editors, but it has been observed that sometimes the system gets hang and slow down the process, so the programs are unable to execute in the practical. To overcome this problem, a cloud based compiler has been designed where all the directories and libraries of compilers get stored individually and simply user want to type the code with the help of software and when the program gets executed then the output will be generated on client machine. The main use of this project is if you have an internet connection (required only once till installation) and if you Don't have a any compiler and editor so you can easily write the code and execute the program and output will show on client machine.

In this project, three compilers namely CSS, HTML and JavaScript using cloud computing which reduces the problem of portability and storage space by making the use of cloud computing, online compiler using cloud computing, which



provides most convenient tool to compile code and remove the errors. These three compilers provide offline compiler service, so no need to install separate compiler on each system machine. To generate SaaS service using cloud computing for compilation purposes in college campus. A centralized server will have all legal data and software's and other systems can access it online. Platform as a Service allows clients to create and manage software applications using tools supplied by the provider.

II. LITERATURE SURVEY

Sr.No	Paper Name	Year	Publications	Conclusion
1.	Online Compiler as a Cloud Service	2014	2014 IEEE International Conference on Advanced Communication Control and Computing Technologies (ICACCCT)	The cloud model described in this paper could be implemented in scenarios where a large number of users will need to compile their programs and view the output in minimal time. An example of such a scenario is online coding contests where the contestants need to submit their programs to a central server for evaluation
2.	Online Editor for Compiling and Executing Different Languages Source Code.	2016	International Journal of Advanced Research in Computer Science and Software Engineering	Compared to the current situation where each machine need to install compilers separately. This project would eliminate the need to install compilers separately on each machine.
3.	Online C/C++ Compiler using Cloud Computing.	2011	Institute of Electrical and Electronics Engineers	By integrating and enhancing the capabilities of these essential technologies, They are introducing the 'Online Compiler' and to contribute to the current examination system.
4.	A Cloud-based Java Compiler for Smart Device	2016	Institute of Electrical and Electronics Engineers	The developed "Cloud-based Java Compiler for Smart Devices" can now be integrated into a Smart Multimedia Learning System for Java programming language to allow users who are learners program on the go with their smart devices.
5.	CLOUD BASED COMPILER	2013	International Journal of Students Research in Technology Management.	Significant im- pact on the signal control & improvement of other intersections.
6.	Online Cloud Based Compilers System	2016	Researchgate.Net	This paper will provide a better solution for various online compilers needs hardware support and pave the way further research in this area.

III. SYSTEM ARCHITECTURE

The system operates server/client architecture. The client requests for services from the server which forwards the request to the cloud engine API. The response is returned to the server which interprets it and sends the appropriate result back to the client. The figure below describes the architecture of the system.

There is a centralized server where the code of database as well as user database is stored. Administrator has a right for authentication and authorization. Administrator can assign the task to clients. Every client should register itself to the system than only can use the features of cloud compiler. In this way security is maintained by using security hash algorithm. Client can choose the compiler and send the code at the server side where compilation and execution will take place.

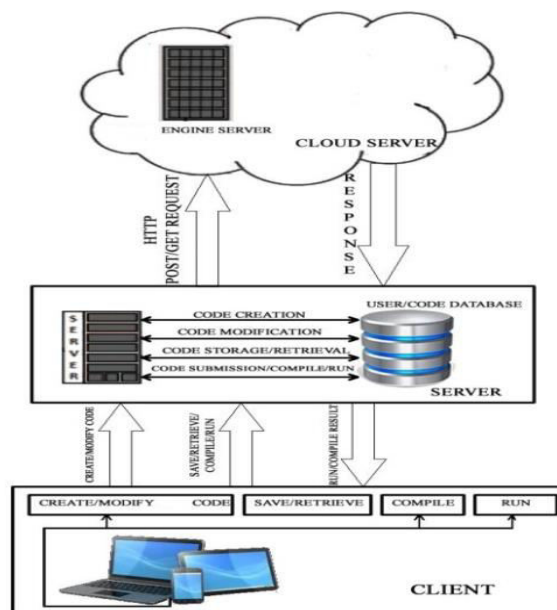


Fig.1. System Architecture

The system developed will have a built in editor where a user can edit his/her created programs. A cloud-based server is to be developed and deployed as Software-as-a-Service (SaaS) to host the compiler that compiles and executes user codes. For this project, an existing online compiler will be used. The system will be developed for the Windows Operating System, with a web-based user interface that can be accessed via a browser on a PC or any device which running on the Windows Operating System.

A. Compiler

Compilers are used to compile programs and convert them from written program to executable binaries. In other words, a compiler is a program that reads a program written in one language and translates it into another language. The compiler creates executable files which can then be run in order to execute the program and its instructions. Every compiler primarily consists of three parts namely;

The Front end: This checks the semantics and syntax of the higher level code (written by the user). Other functions like type checking and error reporting are also performed by the frontend. The Middle end: This performs the optimization through removal or useless code, relocation of computation depending on the context. The Back end: This is the part where the translation of the language actually takes place.

B. Services provide by Cloud Computing

Software as a service (SaaS) includes a complete software offering on the cloud. Users can access a software application hosted by the cloud vendor on pay-per-use basis. This is a Well-established sector.

Result

Student Page:

Student can see the assignment given by teacher by clicking on “SELECT STAFF” button. By clicking on "demo" link student can see what kind of page he actually needs to design. When student click on "click to code" link, Code Editor gets opened and student can write code there

The project will consist of three modules:

1. 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 Planning, designing and creating databases. There is a concept of centralized task assignment and personal chat between admin and client is possible. Admin also have the authority to block applications (for e.g. Win amp, Google chrome etc.). It can also broadcast emails.

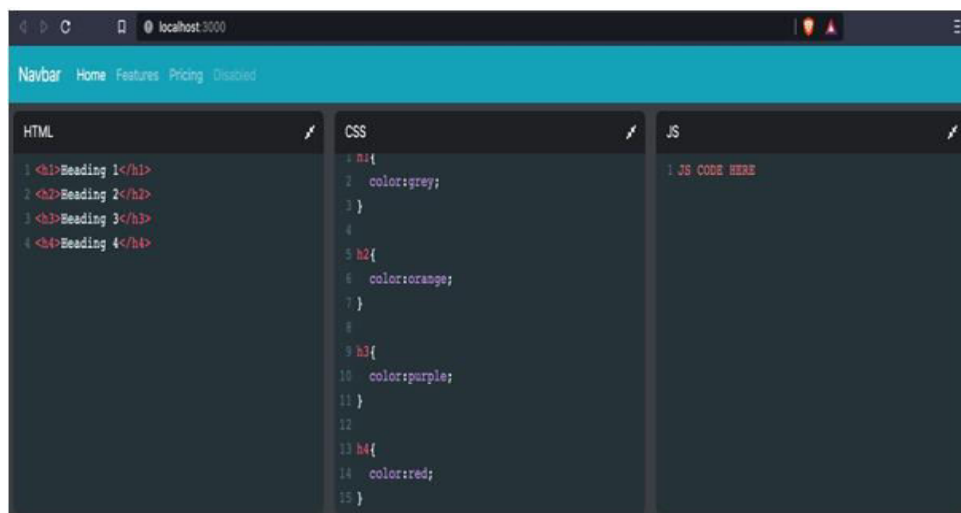
2. Client:

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.

3. 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.

IV. RESULTS



The screenshot shows a web browser window at localhost:3000. The browser's address bar and tabs are visible at the top. Below the browser window, there is a code editor interface with three panels: HTML, CSS, and JS. The HTML panel contains the following code:

```
<h1>Heading 1</h1>
<h2>Heading 2</h2>
<h3>Heading 3</h3>
<h4>Heading 4</h4>
```

 The CSS panel contains the following code:

```
h1{
  color:grey;
}
h2{
  color:orange;
}
h3{
  color:purple;
}
h4{
  color:red;
}
```

 The JS panel contains the text:

```
JS CODE HERE
```

Heading 1
Heading 2
Heading 3
Heading 4



```
HTML
1

CSS
1

JS
1 var para = document.createElement("h1");
  // Create a <p> element
2 para.innerText = "This is a paragraph";
3 document.body.appendChild(para);
  // Append <p> to <body>
4
5
```

This is a paragraph

```
HTML
1 <div class="container">
2 <!-- Tab 1 -->
3 <input type="radio" id="tab-link-1"
  name="tabset" checked="" />
4 <label for="tab-link-1">Tab 1</label>
5 <input type="radio" id="tab-link-2"
  name="tabset" />
6 <label for="tab-link-2">Tab 2</label>
7 <input type="radio" id="tab-link-3"
  name="tabset" />
8 <label for="tab-link-3">Tab 3</label>
9 <!-- Tab content -->
10 <div class="tab-content">

CSS
1 .body {
2 background-color: #fff;
3 font-family: "Overpass", "Open Sans",
  Helvetica, sans-serif;
4 font-size: 1rem;
5 font-weight: 300;
6 line-height: 1.5em;
7 color: #333;
8 position: relative;
9 }
10
11 .container {

JS
1 JS CODE EXAMPLE
```



Tab 1

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut tempor, velit et tempor molestie, urna purus fringilla neque, nec condimentum purus nibh eu tortor. Curabitur non maximus mi. Suspendisse cursus libero nisi, ac imperdiet purus malesuada vel. Cras maximus in quam vel sagittis. Sed ut cursus turpis. Mauris a ipsum congue, sagittis risus commodo, tincidunt mi. Sed mi ante, viverra et iaculis sollicitudin, malesuada vitae turpis. Proin nisi neque, semper a nisl et, dictum feugiat nulla.

Præsent sit amet molestie nunc. In nec tellus cursus, malesuada urna quis, tristique nisl. Vivamus iaculis tempus libero. Mauris nec elit semper, volutpat dolor eu, gravida mauris. Maecenas sed ullamcorper justo. Cras sit amet massa augue. Nam posuere nec justo at auctor.



V. CONCLUSIONS

In conclusion, the system developed affords a user the opportunity to write and execute computer programs (HTML, CSS, JAVA) on his/her machine where he/she is once has internet connectivity (till installation) on the device. This makes it possible for a programmer to easily move around with a programming kit on the go. The developed “ A Cloud-based Compiler” can now be integrated into a Smart Multimedia Learning System for many programming language to allow users who are learners, program on the go with their machines.

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