

Design and Development of a Web-Based Cloud Code Studio for Online Programming and Collaborative Software Development

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Abstract — Now-a-days, android is becoming a basic need of each and everyone. And computer engineers should utilize it as a boon. Currently particular language uses single based IDE. Here, tried a new concept of IDE for multiple languages. Also carrying PC or laptop is not easy task as compared to Android mobiles. Hence along with concept of multiple language compilers, main task is to run and compile programs on android mobiles. Cross platform is USP of this project. For efficient programming, version history along with efficiency counter and collaborative writing approach will help programmers to maintain exact copy and maximize utilization of it.

Keywords- IDE, Android mobiles, Collaborative writing, online compiler, cloud.

I. INTRODUCTION

Internet based computing which is used for utilizing hardware and software resources, is used for Cloud Computing. It helps client side to access and share information from devices like mobiles, laptop, PC's etc. having internet connection. Cloud computing caters to dynamism, abstraction and resource sharing. Dynamism is an important aspect which deals with the fluctuating demands based on seasonal traffic burst and world or regional economy, etc. For example, during sports like the Cricket World Cup, many users visit certain websites for the latest scores, results, fixtures, etc. New servers must meet these increased demands from several clients all over the world if these websites are not cloud based. After the end of the match or finale, these servers may become idle due to less traffic. So, a decision about whether to buy certain servers which will remain idle for maximum period should be purchased, to meet the traffic bursts has to be made. So related issue has been solved by Cloud providers only, by using cloud computing. The cloud provider takes care of fluctuating demands from clients and the organizations have to pay as per their usage. Facility provided by cloud computing is abstraction which allows program developers to focus on their applications. They do not need to think about the software platform on which it will use and operating system, updates or web security. The program developers can concentrate on the core competencies.

Resource sharing shows flexibility to share applications and network resources. Cloud computing includes a flexible architecture in which resources can expand and contract without complexity [7]. Cloud computing allows clients around the world to utilize another feature of accessing applications, without downloading or installing it on their host PC's or mobiles. The cloud owners do not need to reproduce the software or sell it out. The organizations only pay for whatever they utilize, indirectly money is saved. Compared to Local servers and hard drives, Cloud computing provides virtually unlimited storage. It also provides easy collaboration and is very flexible. The cloud services are mainly classified into 3 major types as - IaaS, PaaS and SaaS.

IaaS (Infrastructure as a Service):- The base layer of the cloud stack is IaaS. The IaaS provider supplies the whole cloud infrastructure like the servers, routers. The customers use these resources as a service on an 'as needed' basis.

PaaS (Platform as a Service):- the middle layer of the cloud stack is PaaS. The PaaS provider delivers a platform i.e. a project environment through the Internet for the developers. It can be consumed using the web browser.

SaaS (Software as a Service):- The top most layer of the cloud stack is SaaS. It is directly consumed by the end user. The only requirement is a web browser and an Internet connection.

II. SYSTEM MODEL

The system architecture developed is a three –tier architecture. The Administrator part is conceptually first tier of system. It provides basic functionality of managing overall system profile. Administrator’s main task is to add problem statement or Aim of the project and assigning it to certain clients. In second tier, assigned clients are present which must be registered first and with authentication process log in to system to perform assigned tasks. For authenticated clients there is another policy to manage accessibility so that he can add any other number of people for to edit the available code i.e. Third tier. The Read and write policies can be restricted as per the administrators requirement, means selected users can edit the code and remaining may just give suggestions. Third tier have only those users who edit the programs only if permitted. They saves their copy return back to server. So all program versions / code versions will be maintained. And as Multiple Language Integrated Development Environment (IDE) is used for languages .net, c, java installation of compilers is not needed and can compile using android mobiles too.

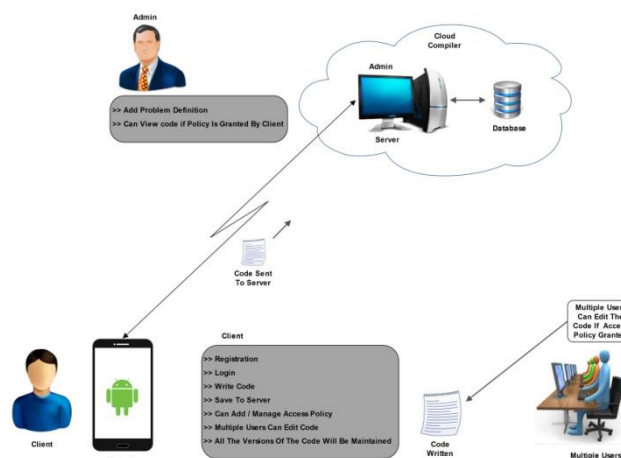


Fig 1: Cloud Based Code Studio

Final work of client is to find best efficient program and return back to administrator. On cloud all programs / documents are going to be located centrally so it provides easy access. System also provides another important aspect to edit collaboratively for modifications and upgrading which is less available in many manual systems.

III. PREVIOUS WORK

For developing any kind of software business analysis is required. The time factor, economy and company strength plays vital role during the development of any tool. The selecting appropriate operating system and language for development of various tools etc., all necessary conditions must satisfy. In development process of any tool, programmers needs help and support.

It is observed that installation of each platform to particular language is very costly, time and space consuming [9]. Also to find whether the Host PC or laptop contains that particular platform or not is very difficult. The time required for interpreters in runtime performance is much and JIT also requires longer time to develop [1][3]. Many software like VMware, Virtual machines etc. uses an

instruction set same as to be used on real machines. So same logic of Language VM helps devices that is not actually present but helps in utilization. Here users were restricted to work only through PC's and laptop, but android concept is new and not worked before [1][3][5].

The main advantages Creation of own instructions set are to reduce the slow interpreters and long compile/optimization times. While compiling the Java classes, registration of allocation of compiler is not needed but only part of program code we run is required. The JVM instruction set is also similar to Java and its compiling is fast, easy to read and simple unlike Java source code.

Previously, user's access policy for any document was limited. Means if certain user is accessing one program file then it was restricted to use same at same time leading to programmers dissatisfaction [7]. Hence the time management was very less efficient. The versioning of files stored was complex and to get appropriate document was very tedious and time consuming. Sometimes lose of document may happen in between process [9].

IV. PROPOSED METHODOLOGY

IDE – (Integrated Development Environment)

An IDE supports software developer in various functionalities such as an interpreter or a compiler, text editor and also to simplify coding at runtime and debugging. Previously, programmers had to write / edit the program, saving it, running the compiler and linker then to build the application. After that we must run it through debugger. But now, the IDE's bring all of them to one place to increase productivity of programmer. They provide support for servers like the JBoss, Oracle Weblogic Server, Apache Tomcat, GlassFish Server, etc. JBoss. Project management tools are also provided by IDE.

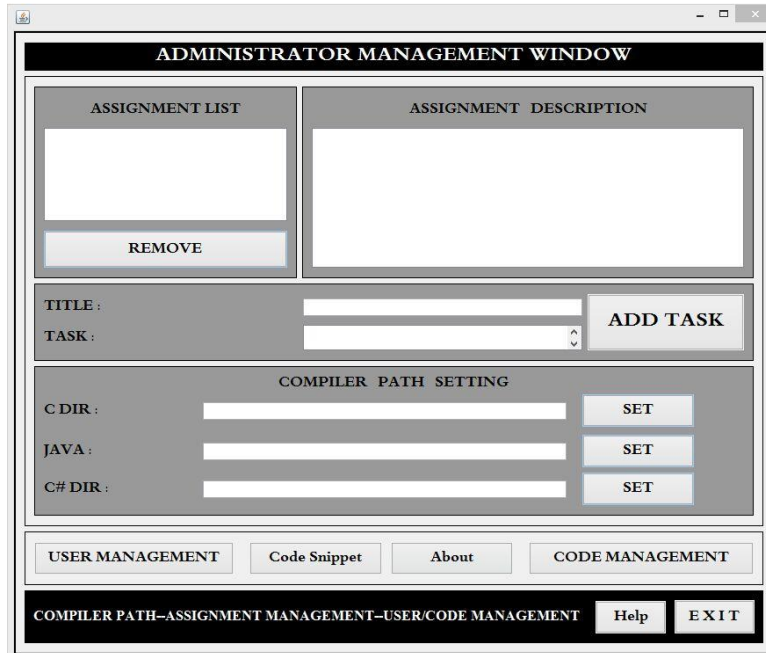


Fig 2: Administrator Window

BBIDE - (Browser Based IDE's) to Code in the Cloud

Most of the times, programmer wants to write programs on devices that don't have required software like mobiles. For e.g. programmer wants to write a JAVA code on device not having JDK or IDE then he/she has to download few MB file then installation process. It is very inconvenient all the time. This drawback is overcome by BBIDE. They are IDE accessible through internet and web

browser. It gives elevating the coding platform to an online environment than traditional way where the OS issues are eliminated easily and hardware independency is gained. It provides increased accessibility to user and portability. Multiple programmers can use this as programming environment. Browser Based IDE is based on Software as a Service (SaaS).

The advantages of BB IDE's are:

1. Increased user accessibility
2. Increased portability
3. platform independent
4. Ability to program with devices like mobile, laptop having Internet connection
5. Sharing and collaborations from different locations along with easy pair programming,

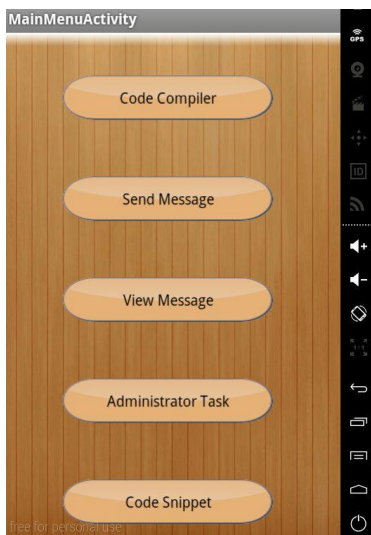


Fig 3: Client android phone Submission

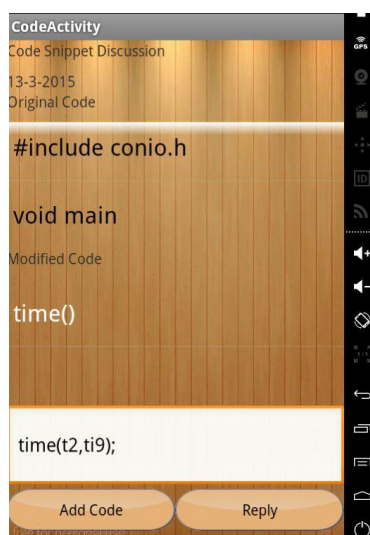


Fig 4: Client Code Activity

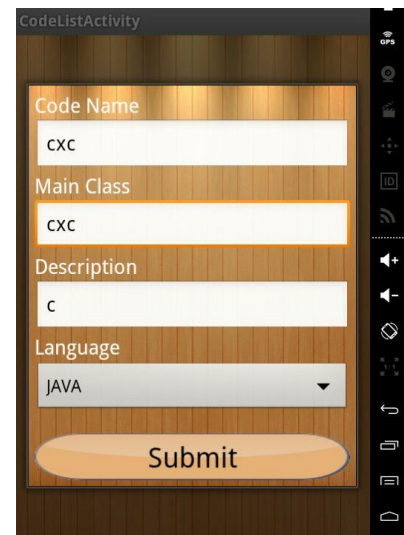


Fig 5: Client Code Submission

Using the Internet and a web browser programmers can code, compiling, run, and test and debug. Fig 2, gives the administrators task assignment. Here admin is handling the server and have full access of application. He creates a task and assigns it to authorized clients in the system or company. Assigned tasks and its description is visible to administrator so can keep watch on Time line of project? A client uses android phones or laptops, so this application has to be installed on devices so as to further usage. Registered clients can see tasked assigned to him though his android in Administrator task tag (refer to fig: 3). so accordingly in code activity window he writes the program and submit it with specified description (refer to fig: 4 and fig: 5). This IDE can be used more than existing desktop IDE. It provides support for uploading the existing code and to test it in the cloud or for sharing with peers. It gives easy, packaging, compilation and deployment of the code in the cloud.

The uploaded files or programs are maintained as a version history. So in case of further detailed study or reutilization, it plays vital role as all versions are maintained on cloud. The application has efficiently helping feature as suggestion message sending by other users during coding part.

V. CONCLUSION

The project aims to create BBIDE to code and compile multiple languages in cloud along with real time collaboration for various clients using android mobiles or laptops. The system provides user convenient and interactive programming tool to run programs online developed by programmers without installing any plug in or software on PC or Android. Also system provides access to clients to write programs from remote locations and can work on same file at same time. Cross platform is USP of this project.

VI. FUTURE SCOPE

1. The system software can be extended for windows Mobiles too.
2. We can include J2EE technologies along with other advanced functionalities.
3. System may provide a feature to save file format as per user convenient at downloading so make client efficient use.
4. During selection of efficient version it may take long time so efficiency of program can be determined using Time or Space complexity

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