Online Cloud Compiler for Android Smartphone

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Abstract— Now a days Cloud computing is a very popular and rising technology using which it is easy to access on-demand network resources in an easy manner. Mobile cloud computing is the availability of cloud computing services in a mobile ecosystem. Mobile cloud computing means services are provided by a cloud and anyone can accessed through mobile platforms. Smartphones enable a new, rich user experience in pervasive computing. The major problem with Smartphone is that hardware resources such as CPUs, memory and batteries are still limited. This paper introduces the use of C/C++/JAVA compilers from cloud on the mobile environment which makes it easy to compile and execute programs anytime anywhere by using their android smartphone. The main aim of this application is that there is no need to install any software/compilers in their phones. Anyone can access these C/C++/JAVA compilers remotely through network. In addition to provide software as a service to the smartphone user, the application also provides with the basic information about the languages like C, C++, Java and SQL. It also facilitates with the quiz section to the user.

Keywords— E-learning, Cloud computing, Mobile cloud computing, compilers, JSON, Mobile, web services.

I. INTRODUCTION

Cloud computing is a good technology which provides flexibility for all educational institutions and the academic organization's needs. The platform and applications in cloud computing may be on the institution campus, off campus, or a combination of both. It fulfils the need of effective infrastructure and deployment model for their dynamic demands. In current scenarios for executing a program we need a machine in which C/C++/JAVA software must be installed separately on each machine. So it is time consuming process as well as it requires more resources. That's why we implement the Beginners Code Application for android users. It consists of three main section i.e. E-learning, compile & execute the code, and quiz section. In which we are using mobile with cloud computing services. Many public and private institutions use cloud computing for better delivery of results even as they work with fewer resources. Now a day everyone has their own android Smartphone using which everyone can compile and execute C/C++ and JAVA programs. It is useful for students, teachers, faculty, and staff .Because of which learning can take place from different places and at any time. Using any Network connected android device the students and teachers can access the content they need.

II. MOBILE CLOUD COMPUTING

Mobile devices are uses more processing power as well as battery life and it require more storage. Cloud computing and mobile are two such things use of these two is changing our lives. Mobile cloud computing is useful in our day to day life. Cloud computing provides an infinite computing resources. So new technology introduced called "Mobile Cloud Computing". Mobile cloud computing is a new platform combining the mobile devices and cloud computing to create a new infrastructure, where cloud performs the hard and heavy lifting of computing tasks and storing huge amounts of data which we cannot perform in mobile. In this new architecture, data processing and data storage is done outside of mobile devices.

Features of mobile cloud computing:
1. Automated backups, uptime, SLA, maintenance.
2. Automated upgrades.
3. Web and mobile access from anywhere.
4. Modern web based integration.
5. Elastic, pay as you go scale up or down.
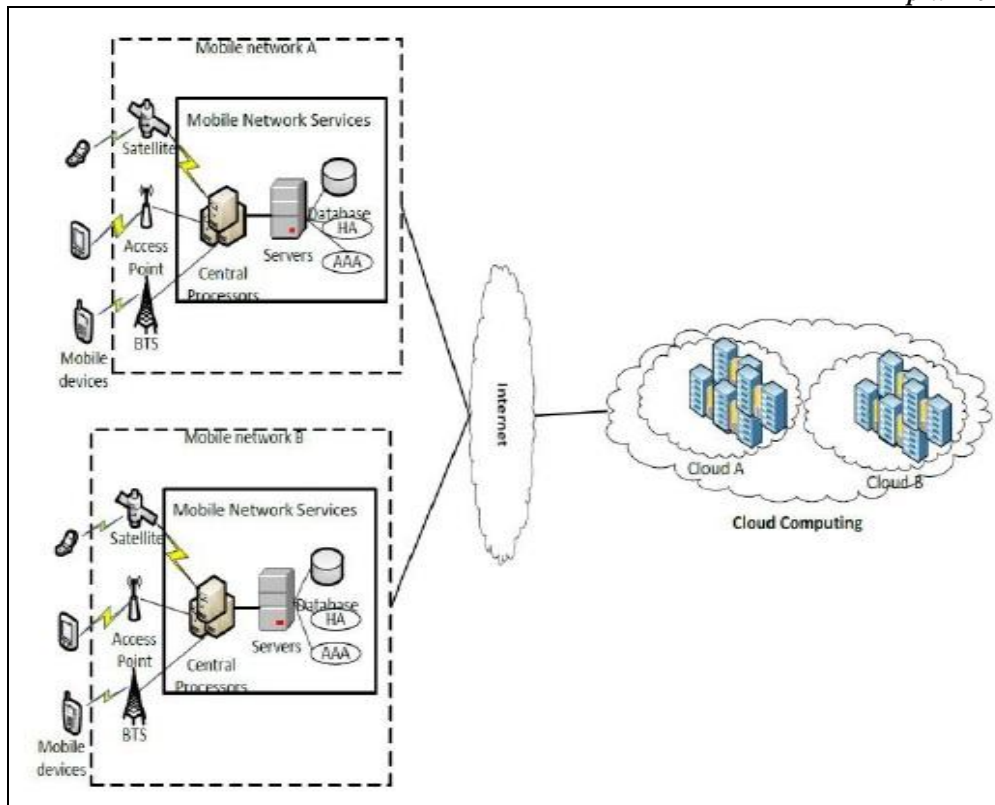6. Multi-tenant solution provided by vendor.

Fig. 1. Mobile Cloud computing

III.   SYSTEM ARCHITECTURE

In system architecture there are three modules:

- Admin module.
- Cloud server.
- User module.

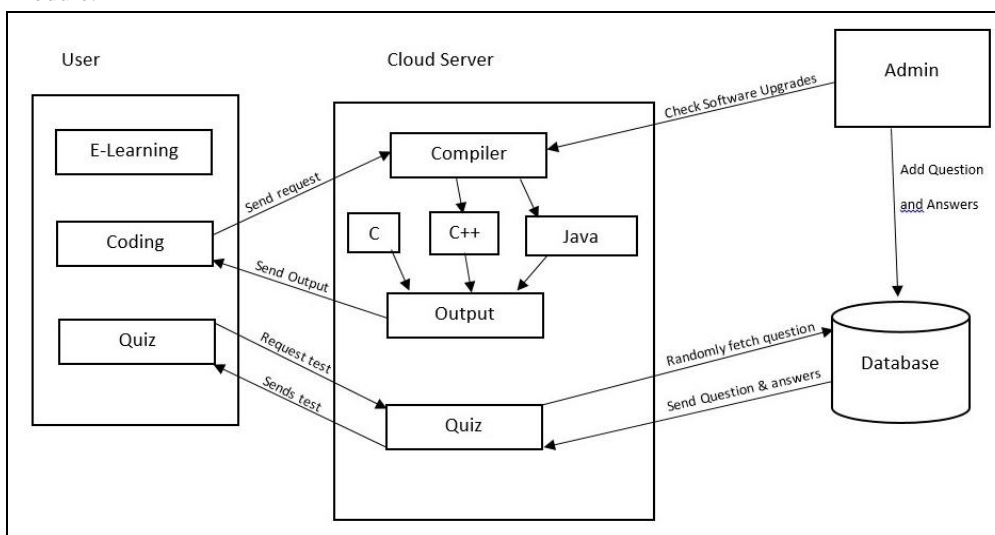

Fig. 2 System Architecture

3.1 Admin:

- Logins with username and password.
- Check for the Upgrade of Software.
- Add question and answers to the Quiz section.

3.2 Cloud server:

Compilers are hosted on to the cloud like C/C++/JAVA. Web services are also hosted on to the cloud. Which are used for interaction between the mobile device and the cloud server on which compilers are installed. Database is used for maintaining the questions and answers for the quiz section. On demand of the test from user, the server will provide randomly fetched questions to the user from the database.

3.3 User:

Users are android mobile users. User is provided with the three sections i.e.: E-learning, compile and execute code and Quiz section. User can gain the basic knowledge about the languages from the E-learning Section. Users are responsible for typing their program and upload that program on the server then server executes the program and displays the result on user's screen. User is also facilitated with the Quiz section in which user can give a test on particular subject and check its Score.

IV. WORKING OF SYSTEM

The user will first select the section in which he is interested: E-learning, Code Compilation or Quiz section. The E-learning section provides the basic knowledge about C, C++, Java and SQL. In the code compilation and execution, the selection of language of the program that is C/C++/JAVA is done and then user writes their program on editor available at Smartphone screen. Then upload the program on server by clicking on compile button. When user clicks on Compile button an android java activity will be executed and the program file will get wrapped into JSON object. After that the program is sent in JSON string format to the server program. Then program is saved on the cloud server. After receiving, the program is sent for compilation. A java application is hosted on to the server which will accept the program file data which is in JSON string format. Then it will send the program to the respective compiler for compilation. If the errors are present in the code, it will display the errors on the user screen else it will display the message "No Error". Then user will click on execute button and the respective program is executed on server and result is again wrapped into the JSON string format and received result is displayed on the device. We have used REST web service over SOAP. Restful web service has more architectural advantages than SOAP using which you can design web services that focus on systems resources including how resource states are transferred over HTTP by a multiple users
writing many programs in different languages.

REST web service having following features:

i. It is a light weight web service, so it can easy to access.

ii. REST uses HTTP methods like GET, POST, DO, etc.

iii. It transfers XML, HTML, JavaScript Object Notation etc
where SOAP transfers only XML.

The last section consists of the Quiz section. In quiz section the user request the server to conduct a multiple choice question test. The Server fetches the question and answer randomly of the particular subject from the database. The question and answer are sent from the server to the client user. The test is conducted and the correct answer is stored at the background to verify the answer is right or wrong. The Score is calculated on the basis of the answer given by the user. The Score is displayed to the user.

4.1 Flow of system:

(a) Login in Network.
(b) Select the module (E-learning, Code Compilation and Quiz)
(c) (E-learning) Read the Basic information about the languages (C, C++, Java and SQL).
(d) (Code Compilation) Select language.
(d) Write the program.
(e) Compile the program on server.
(f) Enter Command Line Arguments if needed.
(g) Execute the program.
(h) Receive the output.
(i) (Quiz) Select the test.
(j) Give the test.
(k) Display the score.
(l) End.

V. CONCLUSIONS

In this paper we have introduced the Mobile Application with three main services E-learning, Code Compilation & execution and quiz. In Coding Section, three online mobile cloud based compilers C, C++ and JAVA are provided. Because now a days to run and execute any simple programs there is need of computer and different compilers a must be installed on it. It is time consuming process and also a number of resources are required. Therefore to avoid the dependency on computer and reduce installation time we have developed an android application by which users can run and execute their programs anytime anywhere using their android smartphone. This application is helpful for students, teachers, programmers, as well as developers. It helps the user by providing the learning process to gain basic knowledge about the different languages. The application also provides the Quiz where user is able to choose a test, give the test and collect its respective score. Ability to use compiler application on mobile devices is that a programmer can easily write the code and provides most convenient tool to compile the code and remove the errors.

ACKNOWLEDGMENT

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