Cloud based "C - Programming" Android Application Framework

Sonali S. Patil
Assistant Professor
Dept. of Information Technology
AITRC Vita, Shivaji University
District: Sangli, State Maharashtra

Vinod B. Ingale
Assistant Professor
Dept. Computer Science Engineering
AITRC, Vita, Shivaji University
District: Sangli, State Maharashtra

ABSTRACT
Cloud computing is the term which opens the new era of computing terminology or metaphor based utility and consumption of computing resources over web. The internet and central remote services of cloud computing retains the data, applications which offers much more efficient computing by centralizing storage, memory, processing bandwidth and other concerned network based terminologies.DNS3 C PRO is cloud based new technique is making the user able to do C programming on mobile devices through which the user can do this work anytime (24 hours) and anywhere (either college or home) as well as to save the installation effort of software (like Turbo C) on PC .This can also save the memory storage of PC.

Keywords
DNS3 CPRO Cloud, Android Application, C Programming, Framework, Functional Requirements, Interface Requirements.

1. INTRODUCTION
On the go it's not possible for programmers to carry a programming kit with them to code; it will be very useful if they can program their code on phone/tablet, which is always with them. Program, Compile and Run the code without the need of compiler in the smart device with the use of the concept of Cloud Computing.

Cloud Computing is a wide-ranging term evolved for computing terminology or metaphor based on the utility and consumption of computing resources over the web. The internet and central remote services of cloud computing retains the data, applications etc which offers much more efficient computing by centralizing storage, memory, processing bandwidth and other concerned network based terminologies automatically without intervenes . The Cloud Computing SAAS (Software as a Service) flavor is used for creating, compiling, and executing C programs on the devices like smart phones, ipads and notebooks. DNS3 CPRO cloud based system is a new technique, for those who are aware about android phone, internet handling and also want to do the software language studies on their mobile device itself and also personal computer or laptop without installing Turbo C i.e. the easy interface to the user through the android phone. To have phoned interface this application must be installed on the user's android phone through which they can easily access the service of DNS3 CPRO system on the mobile to edit, compile and get the output the C program. If the user does not want to install the application they can also use their web browser to access the DNS3 CPRO system, but for this entire user must be in Wi-Fi range or their devices have a Wi-Fi access. The Cloud compiler can serve for many clients at one time without installing and can maintain different compilers on individual clients for program execution.

2. CLOUD COMPUTING AS SAAS (Software as a Service)
The Cloud computing providers rely on sharing the services with device and location independence to achieve multitenancy. The main enabling is virtualization, i.e. autonomic process computing through which the user can ask for provision resources on-demand, by minimizing the user involvement, reduces labor costs and errors in speed.

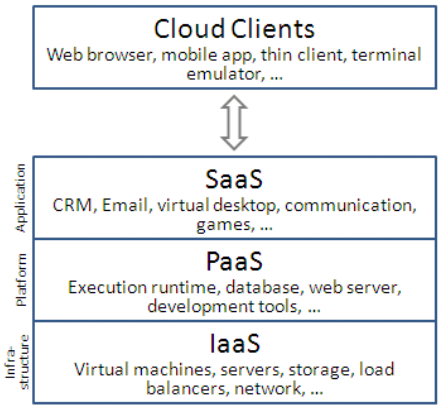


Figure 2.1: Cloud Flavors

The Software as a Service flavor is based on data depository application. SaaS (Software as a service) is designed for web applications authoritative to implement services like post maintenance and some other services. SAAS also impoverish the demand of network security devices, software maintenance and upgrade. The user only needs to have an Internet connection and a smart device to use the required service and software.

Figure 2.2: SAAS Service Model

3. ANDROID OPERATING SYSTEM
Android is a software stack for mobile devices that includes an operating system, middleware and key applications with the aim of all-time high performance by optimizing memory with improved faster and more accurate response. All

applications are written using the Java language by enabling and simplifying the reuse of components, i.e. full access to the same framework APIs used by the core applications and can replace or reuse also. It also includes set of C/C++ libraries used by components through the Android application framework. The Core Libraries provide most of the functionality of the Java language likewise Data Structures, Utilities, File Access, Network Access, Graphics, etc. The Dalvik Virtual Machine provides environment on which every Android application runs in its own process, with its own instance with multiple VMs efficiently working with register-based. By Executing the Dalvik Executable (.dex) format, it's optimized for minimal memory footprint and compilation. The Linux Kernel provides threading, low memory and process management, network stack, drive model and security. Unlike PC operating system, mobile phone operating systems are constrained by their hardware, memory, power dissipation and mobility conditions.

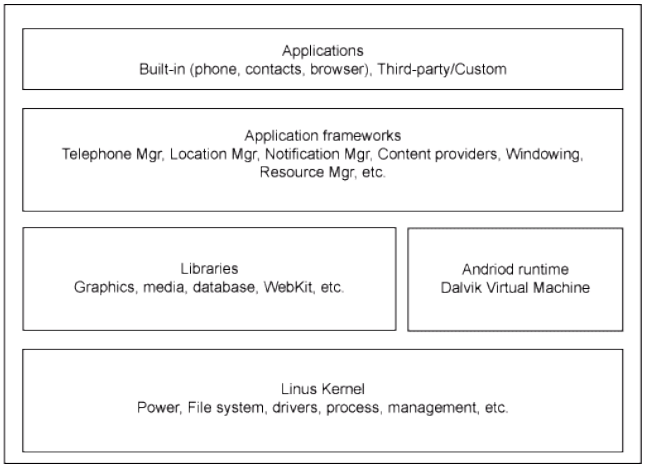


Figure 3.1: Android OS

4. SYSTEM ARCHITECTURE

4.1 Product Perspective

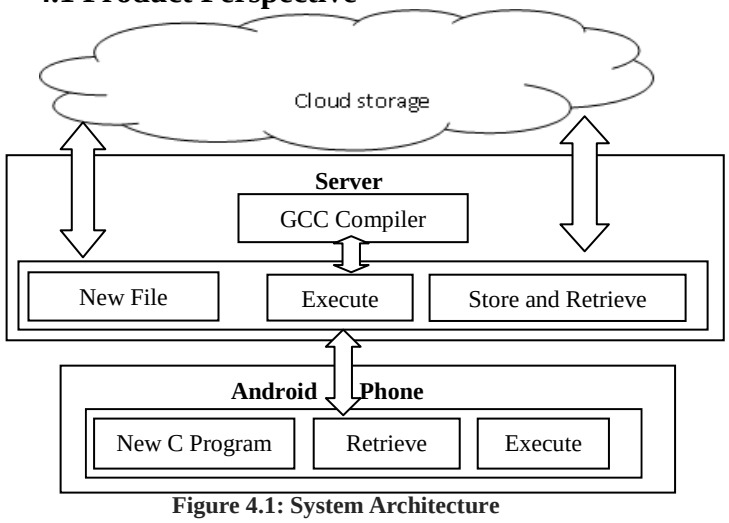


Figure 4.1: System Architecture

1. DNS3 C PRO Cloud:-In this module, we are going to develop the Java based tool that will configure to GCC compiler. This tool can compile and execute the C programs and the result will be shown to the user. It is a browser based app that can be accessible from any browser on the network also on any smart phone devices having groups or Wi-Fi support.
2. Android application:-In this module, we are going to develop a User interface on android phone in which user can type the c program. Also compile and execute functionality will be separately provided on the phone. And the result will be displayed on result box. The phone will be connected to the cloud server via Wi-Fi Network.
3. Server Application:-This service will be act as an intermediate layer between C pro application and Android phone. Users request for compilation and execution of C programs will be forwarded to these services and it will return the result to Phone.

4.2 Product Functions

Initially user must be signed up for using our services. When I get signed up for this service he will get a user ID from database maintenance. After this the user can get logged in with this unique ID. This will benefit for two users if he wants to save the same portion of code for doing the same at next time. Main processing is done on the Android phone continued. Android Application having function like editor, submit and save, error box, result box (output field). The C code will be edited in the editor of mobile application after the code gets edited it must be submitted for further processing that process will be done on the server side which is connected to the cloud .The cloud having the GCC compiler installed on which C code can compile and executed after the code get executed. The output will be displayed on the output window of the phone. If the C code has an error, then it will be shown in the error window of the mobile application.

4.3 General Assumptions and Dependencies (Users and System Perspective)

- Can use service easily with an android phone.
- The administrator must have a networking knowledge.
- The user can also access this service through the web browsers.
- The application runs under Wi-Fi connection.
- The application will only run on Android phone.
- The Operating system should have cloud server service providing likewise OS UBUNTU 10.4

4.4 DFD

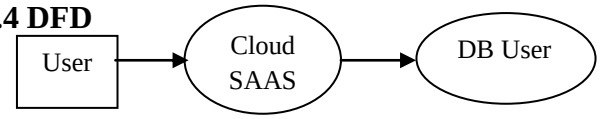


Figure 4.4.1

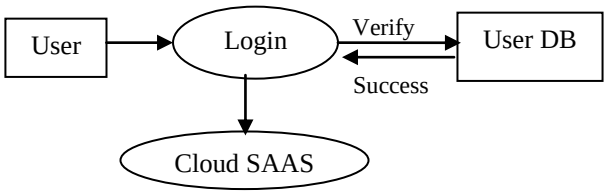


Figure 4.4.2

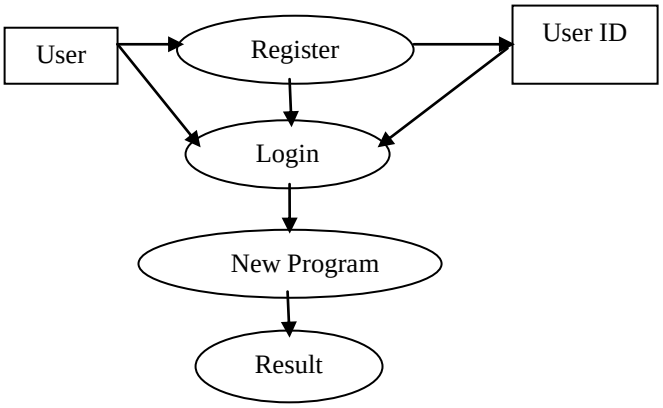


Figure 4.4.3

5. FUNCTIONAL REQUIREMENTS

5.1 Creation of Android Application:

5.1.1 Intro: The system requires Android phone, Web server and UBUNTU 10.04 cloud server as a functional requirement.

5.1.2 Input: C program will edit on the phone as input and give it to the server for further processing.

5.1.3 Processing: Server side application means Cloud is using for the processing like Compiling and executing the program.

5.1.4 Output: Output of C program will be displayed on the Android based devices

5.2 Creation of Cloud

5.2.1 Intro: Cloud is created for the execution and compilation of C programs.

5.2.2 Input: At the cloud side input will be taken from android base device editor of C.

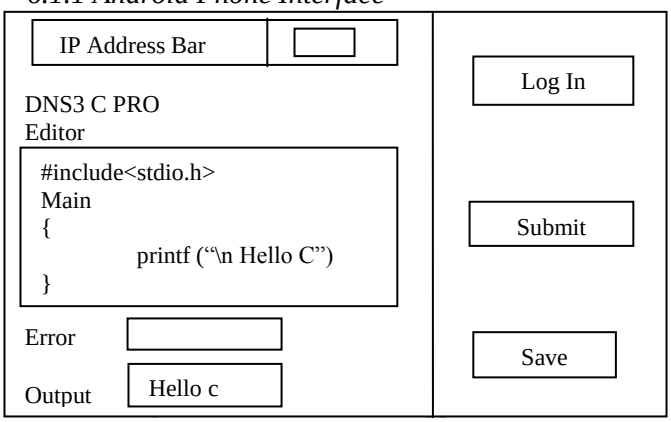
5.2.3 Processing: Cloud will process by executing and compiling the program.

5.2.4 Output: The generated result will be passed to the output field of the Android device.

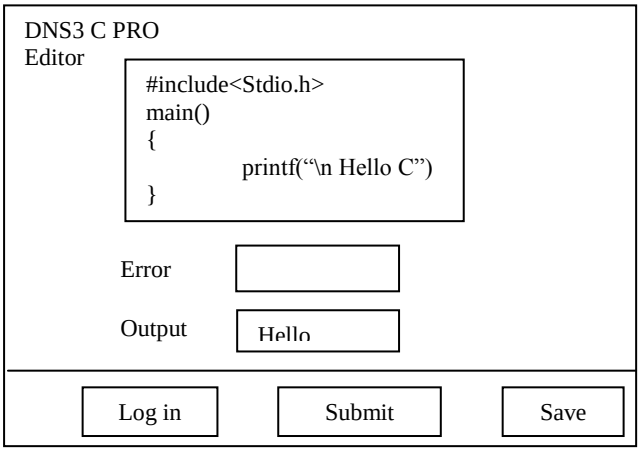
6. EXTERNAL INTERFACE REQUIREMENTS

6.1 User Interface Requirements

6.1.1 Android Phone Interface



6.1. 2 Web browser interface



6.1.3 Software Tools Used

1. Java (JDK 1.5+)
2. Netbean6.8
3. GCC Compiler
4. Eclipse Helios
5. Android SDK20 with minimum Android OS API2.2

6.2 Communications Requirements

Wi-Fi network uses to establish communication between android phone and server.

6.3 DB requirements: MYSQL

- It's free, fast, reliable open source relational database.
- The MYSQL intends to keep the database engine, fast and reliable.
- It delivers a complete, stable environment for building and deploying database-driven applications.
- It provides the information of users who will use this application.

6.4 Advantages of Android based framework

6.4.1 Performance: Fair range of Wi-Fi than the user will get a high performance.

6.4.2 Reliability: For those who really want to do C programming.

6.4.3Availability: To the user anytime.

6.4.4Maintainability:-Depended on the pay and use scheme

6.4.5Portability : Easy service of doing C programming through a web browser on Android with the Wi-Fi range mandatory.

7. CONCLUSION

Cloud based DNS3 CPRO system is a new technique, for the users who aware about Android based devices, internet handling and also interested to do the software language studies on their mobile device and also personal computer or laptop without installing Turbo C. This paper presents the

easy interface to the user through the Android based devices. Android based framework interface must be installed on the user's android device through which they can easily access the service of DNS3 CPRO system on the mobile or android devices to edit, compile and get the output the C program. In future scope it's possible to implement object oriented programming likewise C++, Java, .Net on the same platform.

8. REFERENCES

[1] Palak Makhija, Naveen Hemarjani, Implementing SAAS: Cloud Computing and Android Based Application Framework for C Programming", IOSR Journal of Computer Engineering (IOSR-JCE) vol. 11, issue 5, pg. 74-78, May. - Jun. 2013

[2] International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Impact Factor (2012): 3.358 Volume 3 Issue 9, September 2014 www.ijsr.net Licensed Under Creative Commons Attribution CC BY Cloud Compiler Based on Android Vijay R. Sonawane 1, Guruprasad S. Iyer 2, Dilip K. Jaiswal

[3] Anirban Kundu, Chandan Banerjee, Rana Dattagupta, "SaaS Oriented Generic Cloud Compiler", International Conference on Computational Intelligence: Modeling Techniques and Applications (CIMTA) 2013.

[4] J. Li Lin, ChangweiZou, Research on Cloud Computing Based on Android Platform, vol.11. Software Guide, 2010.