

Security in Composite Mobile Services and Load Balancing

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ABSTRACT- Composite mobile services refer to access of concurrent services at a time on a mobile phone. Nowadays due to execution of many services simultaneously at a time leads to slow process, time consumption, and excessive load on the system and security issues. “Security in Composite Mobile Services and Load Balancing” aims at providing tool support and middleware infrastructure for the implementation and execution of composite mobile services and also balancing load at the mobile phone’s processor end. Development of this application will ease the usage of composite mobile services by the users resulting in quick speed, secure access and balanced processor load.

Keywords- Composite Services; Load Balancing; Security; WSDL.

I. INTRODUCTION

These days every domain of human life revolves around technology and gadgets. No one in this era is untouched with this technological revolution whether child or a teenager, adult or an old man everyone is indulged according to their interests. Mobile devices a wide range of portable gadgets that enable users to make their life convenient and easy. With the increased usage of mobile devices companies thought of marketing strategy to reach door to door customers in least possible time and cost and this was well supported by the invention were multitasking but development of a new operating system led to advancement enabling user to search, view, book, and many more things just on a single click sitting at a place. But still we could figure out some problems in the existing mobile devices which were rectified by the company by improving the versions of android operating system and making their processors and RAM more powerful but our main aim was to find a solution to the low version devices and also on improved one as Multiple accesses at a time of multiple services, by multiple users lead to slowing down the processor speed, increasing the load on the mobile processor and delaying the execution time resulting into a poor performance. Usage of multiple services lead to hacking and misuse of private data as nowadays security is provided

A. ARCHITECTURE OF ANDROID

The architecture of android is known as Android software stack. It involves a Linux kernel and a collection of C/C++ libraries exposed through an application framework that provides services for, and management of, the run time and applications.[10] The Android software stack is composed of the elements illustrated in Figure1-

Linux kernel — Core services (including hardware drivers, process and memory management, security, network, and power management) are handled by a Linux 2.6 kernel.

- A media library for playback of audio and video media
- A surface manager to provide display management
 - Graphics libraries that include SGL and OpenGL for 2D and 3D graphics
 - SQLite for native database support

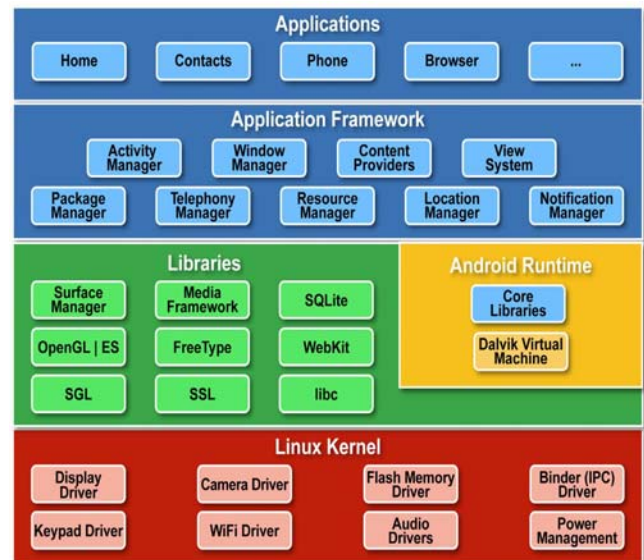


Fig.1: Architecture of Android

through third party tools, that are provided by operating system and their organization to application providers which failed to give a better security and also slow speed makes users unsatisfied as desired task can't be completed.

The primary goal of developing such software is to provide users with concurrent access to multiple services with high speed, balanced load and security. Modules that will demonstrate these activities will need high security, quick processing speed and no interruption due to processor overloading. Other key objective of this application is, if it is connected to server, it shouldn't be accessed remotely; also privacy of data for authentication as well as transactions will be secured. This system will help in also attracting and helping users in accessing maximum applications on mobile devices as one touch can make you reach worlds end. Hence after studying various mobile devices and their systems we came up with this application and tried our level best to overcome the disadvantages.[1]

The kernel also provides an abstraction layer between the hardware and the remainder of the android architecture stack.

Android run time — the run time is what makes an Android phone an Android phone rather than a Linux implementation. Includes the core libraries and the Dalvik VM, the Android run time is the engine that powers your applications and, along with the libraries, forms the basis for the application framework.

Libraries — Running on top of the kernel, Android include various C/C++ core libraries such as libc and SSL, as well as the following:

Core libraries — Although most Android application development is written using the Java language, Dalvik is not a Java VM. The core Android libraries provide most of the functionality available in the core Java libraries, as well as the Android-specific libraries.

Dalvik VM — Dalvik is a register-based Virtual Machine that's been optimized to ensure that a device can run multiple instances efficiently. It relies on the Linux kernel for threading and low-level memory management.

Application framework — The application framework provides the classes used to create Android applications. It also provides a generic abstraction for hardware access and manages the user interface and application resources.

Application layer — All applications, both native and third-party, are built on the application layer by means of the same API libraries. The application layer runs within the Android run time, using the classes and services made available from the application framework.

II. COMPOSITE MOBILE SERVICES AND LOAD BALANCING

Composite mobile services refer to access of concurrent services on mobile devices without any interruption for eg. Booking a hotel and cancelling an air ticket simultaneously or listening songs along with using camera to click pictures. Application of composite services on web is a regular practice but making it feasible on mobile devices is a challenge as issues of load balancing and security over the development.

Load balancing signifies the internal usage of RAM and Central processing unit that directly affect accessing speed and battery consumption.

III. WEB SERVICES DEFINITION LANGUAGE

WSDL is an XML format for describing network services as a set of endpoints operating on messages containing either document-oriented or procedure-oriented information. The operations and messages are described abstractly, and then bound to a concrete network protocol and message format to define an endpoint. Related concrete endpoints are combined into abstract endpoints (services). WSDL is extensible to allow description of endpoints and their messages regardless of what message formats or network protocols are used to communicate. Comparing wsdL with Http It is more Secure and Safe as It helps in generating different Uniform Resource locators (URL's) That helps to maintain the security also it helps in increasing the speed of the web service. [8]

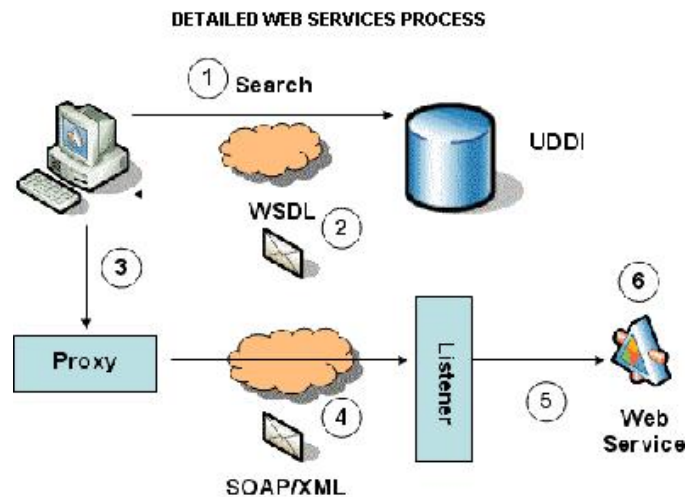


Fig. 2: Represents process flow of web service

IV. EXISTING SYSTEM

We have been using the android phones since many years and many improvements have been made time to time. At the starting point of android application development there were many problems regarding speed, load balancing and

security but as the research were made on these problems corporations started improving the specifications of the android phones to get a better and improvised efficiency. But it has been noticed that they started the improvement in the RAM specification but did not use a new technology as it can be costlier compared to this improvement. Like in Samsung mobiles many improvements has been, seeing the model like Samsung galaxy Ace to the present published phones like Samsung galaxy Grand to Samsung galaxy Note3. They have been improving the Ram specifications rather than focusing on a newer technology like WSDL and thread management as it can be costlier.

V. PROPOSED SYSTEM

Now coming to the product, we have improved the security using WSDL instead of http that maintains different URLs for different pages with quick accessing speed, load is being balanced by thread management system so that one service runs at a time reducing the processor load and finally all applications work concurrently reducing the chances of load and less speed.

This ‘system security in composite mobile services and load balancing’ helped in overcoming the problems in existing mobile devices that were unable to run composite mobile services. Along with they lacked load balancing mechanism and security while accessing services and had a chance of illegal access when connected to server resulting in improper management of battery power. These all problems in our proposed system would be solved by using thread pulling mechanism and back intent services off technique supported by android mechanism and quick access speed and security will be maintained by introduction of WSDL (Web Services Definition Language) over Http (Hyper text Transfer Protocol) and this will also help in reduction of battery usage up to 50% while usage of composite applications whether stand alone or web in comparison to existing mobile devices.

VI. METHODOLOGY

Slow access speed, unable to access composite services frequently on mobile devices, lack of security, improper load balancing resulting into high battery consumption leading to poor services performance on mobile devices and unsatisfied customer end. [1]

All these problems were solved by following ways:

SECURITY- As security is a major point of concern we targeted the issue, we developed our application by using WSDL instead of http which helps in maintain the security level high and provides quick accessing speed compared to Http. WSDL also enables us to generated different URL’s which increases the security mechanism.

LOAD BALANCING- Balancing load for better performance at customer end while accessing composite services is equally important as we need to balance the load at processor end by thread pulling and switching off back intent services so that one services runs at a time reducing the processor load and half the battery consumption than in regular devices.

COMPOSITE SERVICES- All those applications that can work together concurrently likewise we demonstrated this by showing two stand alone modules let’s say, camera working along with media player and voice recorder working during a call.

VII. EMPIRICAL RESULTS

We tested our application by uploading on the developer’s console provided by Google play store hence the table below demonstrates the standard processor usage percentage with respect to reduced percentage generated by our application.

This table below shows the different ranges of the standard uses and the application uses.

TABLE 1: Applications and its CPU usage

APPLICATIONS	STANDARD USAGE	OUR APPLICATION USAGE
CALLING MODE	2.34%	0.77-1.21%
VOICE RECORDER	1.70%	0.89-1.71%
CAMERA	1.52%	0.88-0.89%
MEDIA PLAYER	2.54%	2.18-2.20%

This table shows the web application as well as its usage:-

TABLE 2: Web Applications and Usage

WEB APPLICATION	USAGE
HTTP	1.20%
WSDL	0.57%

The graph shown below demonstrated the variation between application along with gives a comparison of processor usage difference between Http and Wsdl.

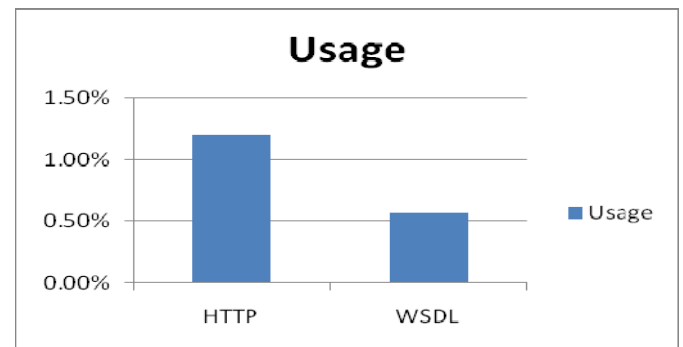


Fig. 3: Graph line representing Http vs Wsdl

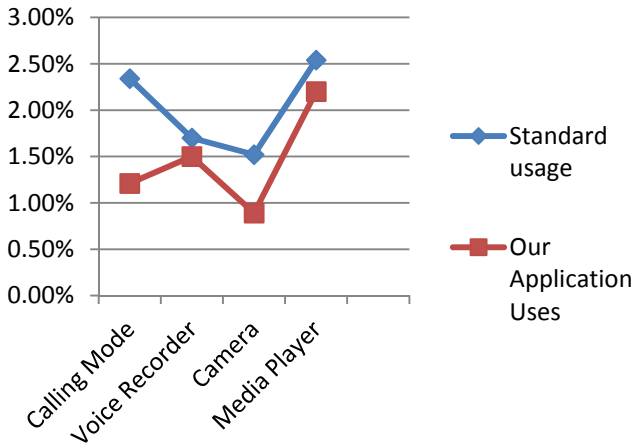


Fig. 4: line representing the variations of the different application uses

VIII. CONCLUSION AND FUTURE WORK

During the last decade we have witnessed a tremendous growth within the IT industry. Customers want speed and improved cost effective performance, but only if it comes with reliable services. This requires fundamental rethinking of the traditional methods which is used in the present operating systems. In this product, we illustrated two composite services working simultaneously with high effective performance, security and load balancing. In this work, we have created standalone applications as well as web services to illustrate our approaches. Some of the scopes are like in system load balancing will be managed,

along with security providing high speed and an ease to access multiple service. Users will be able to use, access, book, shop online in quick time. No interruption or application will get failed while accessing multiple services. Increased speed plus less Battery consumption. Now the advantages of this product is that it has a solution to the load balancing and security issues which has been seen in the low specification mobile phones. We hope to see this product being a part of the operating system to eradicate the present issues.

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