

Location Based Profile Changing and Automated Mobile Monitoring System

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Abstract: - In today's competitive environment where Android has occupied approximately 73 percent of global market. Android is having great features and ubiquitous use in almost all fields possible to build an Android application through which we can change the profile of the device based on GPS location and monitor the target Android devices Call Logs, SMS, E-mails and we will even store the information on the web server, on which an authorized person can view the stored information later. Basically this paper is divided into two modules. In module one, we have developed an application that will automatically change the profile of the Android device using GPS and mobile number. We have set circles of particular radius by its longitude and latitude and when registered device will enter in a circle of a particular zone, it will be detected by devices mobile number and accordingly location stored on the web server will be matched and updated and profile will be activated. In module two, registered members of the family can stay aware and monitor the mobile devices which must be operating on Android operating system. We are monitoring the details like their Call Logs, SMS, E-mails (rooted) and location. All these data will be stored on a web server which will be accessed from Android device by using Restful web services. An authorized person's device must first register on the web server. For convenience, the alerts will be delivered to the authorized person's mobile device, as per the updating in the time and location. An authorized person can also view the details and all the daily updating of registered device later. The technologies which have been used to develop this whole system are Android SDK, JDK, PHP, JSON, RESTful web services. Our application run at background side of mobile which can auto start on mobile start-up and on installation.

Keywords

GPS, MD-5, RESTful, Web server, Android

I. INTRODUCTION

In our society there are many crimes taking place on every day especially when matter comes to Children, girls, old

peoples so the security and safety of common people are getting compromised day by day. So there is strong need and demand by the time for the system will monitor or keep eyes on the activities of the peoples for their security purpose. But on the other hand different mobile technologies are present in market which can help us for overcoming on these problems. When we talk about the mobile technologies there is no better option other than the Android in the current market. Android is occupying the 73 percent market of the Smartphone's worldwide and it is almost used by every group age of the society. It is most popular mobile operating system which people likes now a days. Location based profile changer and automated monitoring system is application which is going to build for Android device which will change the profile of the Android device automatically and monitor the call logs, SMS, email (rooted). Location based profile changer and automated Monitoring system is the software which will allow the authorized person to monitor the target Android device. Authorized person can monitor the activities of cell phone like incoming and outgoing call, text messages, e-mails etc. As target device will be moving from one place to other the system will track the location of target device using GPS and change its profile from one mode to other that is silent, general, vibrating etc. If target device went out of the allocated geographical area the system will send the notification to the authorized person. The system will store all the information on to the centralize server (web server) and deliver the notification to the authorized persons cell phone and authorized person can also login to the centralized server (web server) and can see all the information of its target device later. Location Based Profile Changing And Automated Mobile Monitoring System Positioning System (GPS) is the top priority technology used for locating the devices location accurately. Platform that we are using for this System will be Android operating system as it is the best operating system for a context aware location based services. All the information will also be stored on the web server using mysql database. A person who wants to monitor any particular Android device must be first register on the Android

application of a target device. Only after registering to system the authorized person will be able to monitor the target device and receive the SMS alerts. On the client side of the system that is Android application will be developed in JAVA programming language on the Android operating system. PHP will be used on server side of the system, that is, centralized server (web server) front end will be developed in PHP programming language and database of the web server will be maintained by using mysqli database.

II. RELATED WORK

In the current available system the tracking is done with the help of tags. Where the tags are fixed at the different places for finding the exact location of the device. But the limitation of this system is that it is only working for those places where the tags are already fixed and the system gives the response when the device reach to that particular place. In the existing system the android device are connected with each other by either the Bluetooth or wireless LAN. In tracking system communication link to the server is managed by wireless LAN which is slow. In the current available monitoring system the authorized person cannot trace the phone Activity like call logs, sms etc. In these systems also the facility of sending the alerts or Notification is also not possible from authorized person to target device and from target device to authorize device as well. These systems are also not secure against suspicious individual, and have very high cost. Current existing systems are only available for small scale projects for example for tracking the employee of that particular company or an organization where the employee of the company crosses the allocated area the message are deliver to the manager in sms format and this existing system is built on Android 2.1 (Eclair)[1].

This existing system will facilitate user with location aware services. Most promising Type of contextual information is the proximity selection known as Location Based Service (LBS). Tracking location of mobile device accurately has been a challenging research topic for decades. Global Positioning System (GPS) is a top priority technology used for locating a device position accurately. Methodology for tracking can be done using a GPS receiver Which is an additional hardware integrated in most of mobile equipments. GPS has been Used as an idea for location tracking[2]. There is another Android application named as call monitor available which calculates the call minutes on monthly basis. This application also maintains the SMS count and statistics of call in, call out and missed. This application maintains the history of max 3 months call log[9].

In the current available existing system the profile changing is done on the time bases where the time period is set already and actions are also defined on the time bases the profile of the device changes automatically. In current available Android application like Llama uses phone masts (Tower) to determine your location, so that you can change your ringer, vibrate and ringtones depending on where you are as well as the time of day. Llama provides you with sound pro- files so you can

quickly switch between quiet, loud, silent and normal sound settings. You can set your family, partner and children to ring even if your phone is set to silent [8].

III. PROPOSED WORK

We are proposing the new generation automated profile changing and mobile monitoring system where the Android device will register their self on the web server to the authorized person during the registration process the user name and password will be provided to the Android device for the security purposes of the system. After this process Android device will get register to the authorized person who will have the all rights of monitoring the Android device. Whenever the Android device will move from one location to another location the profile of the Android device will be changed automatically .The Profile changing will take place on the bases of location and action which have to take place stored on the web server. For profile changing this system will avail the services of the GPS (Global Positioning System).The system will also able to monitor the Call logs, SMS and Emails (rooted) of the Android device and all these information will be securely store on the web server by using web services. These entire information authorized person can view later by logging to the web server. In this system whenever the Android device will move from one location to another the notification or alert will be deliver to authorized device and if certain situation arises when the authorized device need to deliver the alert or messages to the Android devices it can also be done by this system.

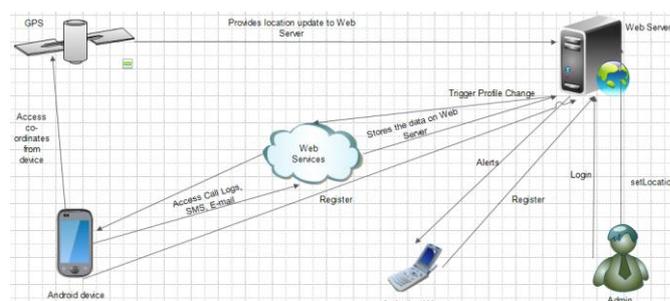


Fig: 1- Block Diagram Of location Based Profile Changing And Automated Monitoring System

IV. TECHNOLOGY

4.1 Web Server

Web server is used to access web content through the internet. It is combination of Hardware (the computer) and software (the computer application). Web server is mostly used to host websites, but there is also used for gaming, data storage or running enterprise Applications. Web server are create web page to request of clients using the Hypertext Transfer

Protocol (HTTP). HTML documents are included by document, such as images, style sheets and scripts. Many web servers support server side scripting using Active Server Pages (ASP), PHP, or other scripting languages. There are many common features of web server as following. Virtual hosting to serve many web sites using one IP address. Large file support to be able to serve files whose size is greater than 2GB on 32 bit OS. Bandwidth throttling to limit the speed of responses in order to not saturate the network and to be able to serve more clients. Server-side scripting to generate dynamic web pages, still keeping web server and website implementations separate from each other.

Web Server is machine that delivers web pages. Web Server consist of IP address and domain name. Every web page has unique address called URL. Data is transferred using HTTP protocol. There are several types of Web Servers like Apache HTTP server, Internet Information Services, Lighttpd, Sun java system web server, Jigsaw server and many others.

4.1.1 Apache HTTP server:

It is the most popular web server. It is open source means its code will be available to one and all so that we will be able to make changes. It can be installed on all operating system. Apache with tomcat module provide support for JSP and J2EE.

4.1.2 Internet Information Services:

It is the web server from Microsoft, which is fast and efficient but not open source.

4.1.3 Lighttpd:

It is free web server distributed under FreeBSD operating system. It is open source.

4.1.4 Sun Java system web server:

It is suited for medium and large web sites

4.1.5 Jigsaw Server:

It is W3C's server and it is open source also. It is written in java and can run CGI script and php programs.

4.2 RESTful Web Services:

RESTful web services are the alternative for SOAP and WSDL based web services. REST has been accepted by giants like Yahoo, Google, and Facebook. REST is easier to use and understand and it is a resource oriented model. REST defines set of architectural principles to design web services and its main focus is on system's resources. Just like android has emerged in mobile operating system market; similarly, REST has emerged in web services.

REST web services basic design principles:

- REST uses HTTP methods explicitly
- Stateless
- Directory structure is like URI
- Transfer XML, JSON, or both

4.2.1 REST uses HTTP methods explicitly:

It uses HTTP methods explicitly follows protocol defined in RFC 2616. This principle establishes one-to-one mapping between create, read, update and delete operations and HTTP

methods. POST is used to create a resource, GET is used to retrieve a resource, PUT is used to change/update state of resource. DELETE is used to remove/delete resources.

4.2.2 Stateless:

There must be less response time of a web service call. There are no states that will be held by Web Server. Only client is responsible for all requests. Server side does not store any sequence; so, it is stateless, which improves performance of the web service. Server need not to be synchronizing session data with external application. Stateless service shifts most responsibilities of requesting and maintaining state to client side. By doing such way, it will save bandwidth and minimize server-side application state application state.

4.2.3 Directory structure is like URI:

URI determine how intuitive REST web service must be. It is client addressing resources. Directory structure is defined just like URI. Structure is hierarchical, rooted to single path, branching for sub paths. URI structure for RESTful web services.

4.2.4 Transfer XML, JSON or both:

Resource representation reflects current state, its attributes at the time client application request. Format of the data must be simple, human readable, and connected.

4.3 Dalvik Virtual Machine

Java virtual machine is high performance and provides excellent memory management. But it needs to be optimized for low handheld devices like mobile. The Dalvik Virtual Machine is optimized for mobile device. It optimizes the JVM for memory, performance and battery life [8].

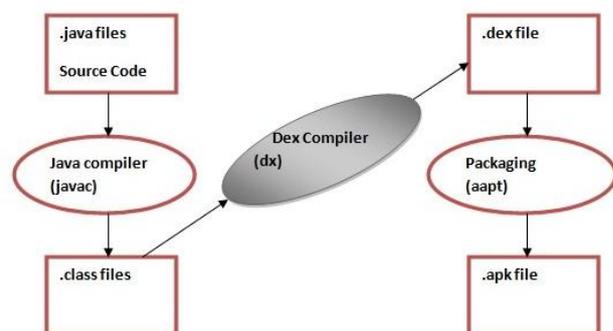


Figure 2: Block Diagram of Dalvik Virtual Machine

4.4 GPS

GPS, which stands for Global Positioning System, is the oldest computerized locating technique and in wide spread use, as it's the only technique with a world-wide (outdoor)

coverage. The uses of GPS are must for the application to run. As soon as the co-ordinates of the location which are set by the user are match with help of GPS, the profile is updated. GPS Coordinates i.e. latitudes longitudes would be received from GPS satellite on ANDRIOD mobile with GPS functionality or GOOGLE Maps functionality on mobiles. GPS coordinates latitudes and longitudes can be entered manually when the system is to be tested on Android Emulator [4].

V. SECURITY

For the security of the system it is required that the information should be protected from the unauthorized or outside user. For maintaining and assuring the security, integrity, confidentiality, authentication data is required to be in encrypted format. For security of this system we will use MD-5 algorithm. MD5 (Message-Digest algorithm 5): MD-5 is a widely used cryptographic function with a 128-bit hash value. MD5 has been employed in a wide variety of security applications, and is also commonly used to check the integrity of files. An MD5 hash is typically expressed as a 32-digit hexadecimal number.

5.1 ALGORITHM

MD5 processes a variable-length message into a fixed-length output of 128 bits.

STEPS

1. The input message is broken up into chunks of 512-bit blocks (sixteen 32-bit little endian Integers), the message is padded so that its length is divisible by 512.

2. The padding works as follows: first a single bit, 1, is appended to the end of the message.

3. This is followed by as many zeros as are required to bring the length of the message up to 64 bits less than a multiple of 512.

4. The remaining bits are filled up with a 64-bit integer representing the length of the original message, in bits.

5. The MD5 algorithm uses 4 state variables, each of which is a 32 bit integer (an unsigned long on most systems). These variables are sliced and diced and are (eventually) the message digest. The variables are initialized as follows:

A = 0x67452301

B = 0xEFCDAB89

C = 0x98BADCFE

D = 0x10325476.

6. Now on to the actual meat of the algorithm: the main part of the algorithm uses four functions to thoroughly goober the above state variables. Those functions are as follows: $F(X, Y, Z) = (X \oplus Y) \oplus (X \oplus Z)$

$G(X, Y, Z) = (X \oplus Z) \oplus (Y \oplus Z)$ $H(X, Y, Z) = X$

$Y \oplus Z$ $I(X; Y; Z) = Y \oplus (X \oplus Z)$ Where; \oplus ; and are the bit \square Wise AND; OR; XOR; and NOT operators

7. These functions, using the state variables and the message as input, are used to transform the state Variables from their initial state into what will become the message digests. For each 512 bits of the message, the rounds performed (this is only pseudo-code, don't try to compile it) after this step, the message digest is Stored in the state variables (A, B, C, and D). To get it into the hexadecimal form you are used to seeing, output the hex values of each the state variables, least significant byte first.

VI. CONCLUSION

We will develop the system which will monitor the movement of android based device and store its information on web server. We will also send notification to registered device when the movements of the target Android device will in particular area. We will store the information on web server using GPS for location and web services for Call logs, SMS, Emails.

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