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Android Application for Tracking Lost Smartphone

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Abstract: ***With the development of technology now mobile devices can perform different official activities beside the personal ones. People can store password, valuable documents, pictures, videos and many other private and confidential contents inside their mobile devices. Moreover, high performing mobile devices are very costly. But mobile devices being stolen or missed is a worldwide daily affair, which incurs great loss upon people. In this paper, the idea of an application has been proposed which helps to strengthen the security of mobile devices. It retrieves the International Mobile Station Equipment Identity (IMIE) number, recent contact list, geological location, and the new SIM's number from the lost device, and finally sends this information to the actual owner of the device. This information is helpful to find the exact location and other details of that lost mobile device. Thus this proposed application acts as a security tool for the smart phones and other mobile devices. The contribution of this proposed application is that it would be very convenient for people of developing country for its cost effectiveness and will be independent from telecom operator.***

Keywords-Smartphone; Security; Trace Lost Phone.

I. INTRODUCTION

Developing an efficient and effective mobile application is always a challenging matter that needs a proper idea and a standard implementation. This project is taken in concern keeping all these factors in mind. Therefore, the project will fulfill the need of all the users who use Linux Operating System based smart phones or other mobile devices across the world. It is expected that this application will be a common like for all the users, and will be able to cover maximum user's expectation and attraction, because it will protect the safety of their valuable devices from unwanted situations.

II. LITERATURE SURVEY

There are few applications in the Android market like Wheres My Droid, Mobile Anti Virus Security Pro and AVAST Mobile Security which claim that these can trace a mobile after it gets lost. But there are many limitations of these applications, which make these applications ineffective for providing complete mobile security. These are:

1) MNC (Mobile Network Code):

Mobile network code is not familiar to normal users; they need help form Mobile Network Provider to use MNC. Therefore, the proposed application does not use MNC.

2) MCC (Mobile Country Code):

Mobile country code is not required to trace the lost mobile. As, it is highly probable that no thief goes abroad after stealing mobiles. As a result, we also have not considered MCC and make the proposed application more user-friendly.

3) Captured image:

This is not a good concept, because front-side camera is not available with all the mobile phones, and it is hardly possible that the mobile has captured the thief's photo. This option is completely not feasible, so in this work, image collection is ignored.

4) Recorded voice:

This is not a good idea again for all these cases. Recorded audio files take large space in the memory, therefore while sending those to the owner it will take a large bandwidth. In the case of low bandwidth GPRS networks concept will not work properly.

None of these applications return IMIE information or the SIM's activity to its owner which is most important for tracing the lost mobile device. Therefore the limitations of existing applications are destroying complete memory rather than preserving that information. However, all these limitations are making all existing applications ineffective to retrieve a lost or stolen mobile device especially lost data hence it makes them ineffective in providing complete mobile security.

III. PROPOSED SYSTEM

Android mobiles are now available for cheap cost. The mobile owner need not go to file a case to the Mobile Service Provider or to the Police and expend huge money to retrieve their cheap mobile if this recovery work can be done using a small application. This proposed mobile application can help to retrieve any lost mobile device, and can strengthen the security of the device. It is a very useful and profitable for the user because of its unique features and limitation-free nature. All types of mobile devices or tablets will be able to run this application.

IV. PROPOSED FEATURES

1) SIM Change Alert:

First step of this proposed application is to confirm that the device is lost. Unlike some other existing applications, the proposed application also detects whether the mobile is lost if the SIM card is changed. This process may cause confusion as SIM card can be changed by owner of the mobile device which is not a lost state for the mobile. But, as for an application there is no alternative way to understand whether the mobile is lost or not, it is considered that generally the owners do not change their SIM card very frequently. Receive an automatic SIM change notification/alert along with new SIM number. To stop the alert user need to send command.

2) Obtain IMEI Number:

Obtaining IMIE number is the main action to be done for tracing a mobile device. As maximum people do not know their device's IMIE number, tracing it can help best to retrieve the lost device. When the application finds that it is lost, it will trace the IMIE number and will send it to the actual owner of the device either via SMS or Email.

3) Get The Geographical Location:

Getting the lost mobile's current location is another major action to be taken. For this the Android "Geocoder" class is used. This class helps to retrieve the accurate latitude and longitude of the lost device, by which one can trace his device's exact location wherever it is. Next, the application will check whether the latitude and longitude is correctly retrieved or not, and finally it will be sent to the owner via SMS or Email.

4) Get Call Logs:

This application also grabs the entire call log of the thief. Sometime this helps to trace about whom the thief is contacting. By sending a command we can get an entire incoming and outgoing calls history.

V. FUNCTIONALITY OF PROPOSED SYSTEM

Pre-condition:

i. The application (A) is installed and running background
ii. SIM card is changed from previous SIM card Number

Post-Condition:

i. Owner can know the current location and phone activity of lost mobile.

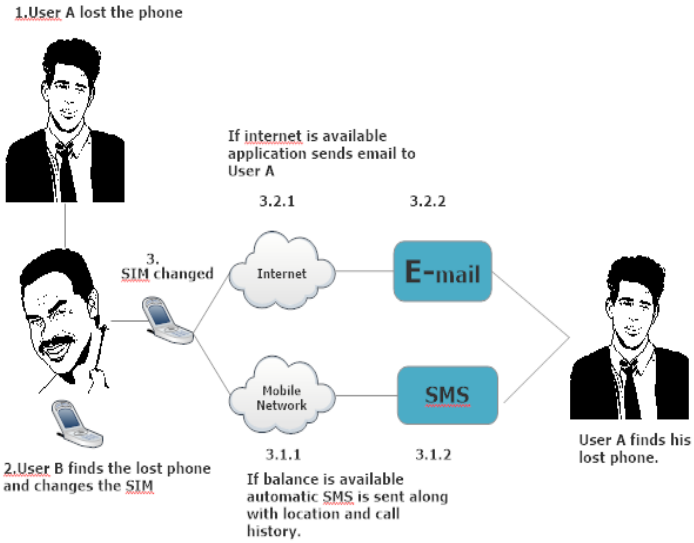

Fig.1 Scenario of proposed system

1. Service of A is invoked.
2. Retrieve IMIE number, SIM number, last MAX_DAILED dialed number, last MAX_GEO_LOCATION geographical locations and stored as a SMS as well as offline Email.
3. Check balance to send SMS to PRE_CONFIGURD_NUMBER.
   3.1 If balance is sufficient for SMS, send saved SMS with Information retrieved at step 2.
   3.2 Else check for internet connection.
   3.2.1If internet connection is available send saved offline Email

Else wait for internet connection and periodically check step 3 and 3.2

Table 1. Notations used in functionality

Notation	Meaning
MAX_DAILED	Maximum number of recent called numbers
MAX_GEO_LOCATION	Maximum number of recent Location
PRE_CONFIGURD_NUMBER	The SIM number to which SMS would be sent

VI. TECHNOLOGIES USED

This application has been developed using Java Programming Language (J2SE) to run on the Android OS, one of the Linux Operating Systems. As tool we have used is Android SDK.

1) Java Programming Language

The Java Standard Edition (J2SE) will be used which is a widely used platform for programming in the Java language. It is the Java Platform used for deploying portable applications.

2) Linux Operating System

Android is a Linux based operating system which is designed primarily for Touch Screen mobile devices such as Smart-Phone and Tablet-Computers,.

3) Android Studio

It is a tool that helps to develop desktop and mobile applications. It has a plugin ADT (Android Development Tools) that will also be used for developing this application

4) Android SDK

It is a Software Development Kit developed by Android, which is necessary to develop this application.

5) SQLite

SQLite is a open source SQL database that stores data to a text file on a device. Android comes in with built in SQLite database implementation.

VII. ALGORITHM USED

The Advanced Encryption Standard comprises three block ciphers, AES-128, AES-192 and AES-256. AES has a fixed block size of 128 bits and a key size of 128, 192, or 256 bits. The block-size has a maximum of 256 bits, but the key-size has no theoretical maximum. The cipher uses number of encryption rounds which converts plain text to cipher text. The output of each round is the input to the next round. The output of the final round is the encrypted plain text known as cipher text. The input given by the user is entered in a matrix known as State Matrix.

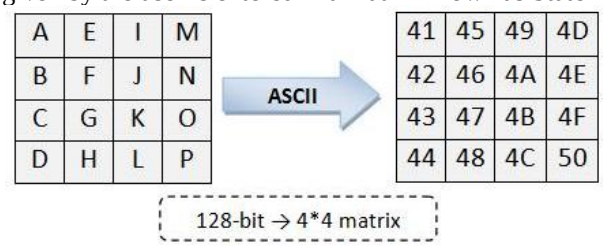

Fig.2: State Matrix

VIII. OUTPUT

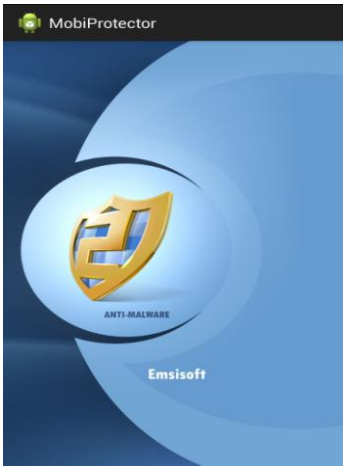

Fig.3 Splash Screen

Splash Screen of MobiProtector, in this following code a handler is used to wait for specific time and once the timer is out we launched main activity. Run the application, you will see the splash screen for 3 sec and then your main activity will be launched.

Fig.4 Registration Screen

The user has to register him by entering his login id and an alpha-numeric password.Resigration is basically used to authenticate a user.

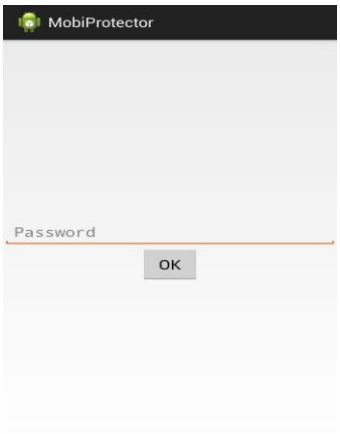

Fig.5 Login Screen

In Login screen the already registered user has to enter his password. Like any other application asks for credentials for login even MobiProtector does the same.
Thus this application will be launched with name Mobiprotector.

After its is launched as a beta version , this application will save lot of difficulties of people like launching a complaint , lots of headache behind finding out thief . As soon as the user download app he will see this 5 pages as shown in above output , hereafter he /she will be asked to enter recipient number , and various other security details,

then he will be registered on thatapplication .Then whenever the situation arises of lost mobile various features decided as per proposed system will work and find out the lost mobile , alert user and save user personal or confidential data being leaked from .

Fig.6 Verification Code Screen

After entering details and clicking verify,in order to verify your details you will be sent a text message with the cod.Since the signal can access your text messages, it will automatically recognize when you receive the code and complete your registration.

IX. FUTURE SCOPE

1) Spy SMS:
Send command to start / stop spying on incoming and outgoing SMS.

2) Backup and Restore:
With MobiProtector, user can easily backup and restore mobile data like Contacts, Calendar and Gallery. The backup and restore also can be viewed online with MobiProtector account.

3) Uninstall Protection:
It will protect your application from being uninstalled.

X. CONCLUSION

This application is a very useful one for users to make their mobile device secure and makes this process easy and convenient for even the normal user. This application reduces expense, at the same time increase the potentiality to find out the lost device.

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