

RMM: A Solution for Sharing data between Remote Mobile Systems

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Abstract: *With the evolution of android operating system smartphones have gained influential position in everyone's day to day life. Android operating system provides certain applications like messaging, call, contacts, file system etc. which serve majority of people. Smartphones have become Personal organizer for almost all users and non-availability of mobile for a day almost creates a chaos in today's fast lane life. People tend to forget their mobile in hurry. Most of the time it becomes difficult to travel back for fetching the mobile. This paper aims to target such situation by accessing the mobile features remotely by using RMM application which is developed for this purpose.*

Keywords: RMM, android, Smartphones, SMS.

I. INTRODUCTION

With the rapid development of mobile Internet, mobile devices have entered people's life and have become an essential part of daily life. Smartphones usage has grown significantly in the recent years and life without smartphones is tough to visualize. Smartphones use android which is based on Linux kernel. The following diagram shows the major components of the android platform.

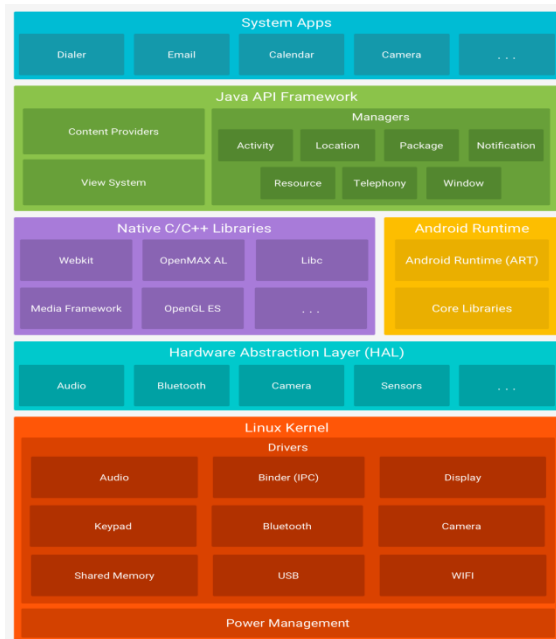


Figure 1: The Android software stack.

The whole feature-set of the Android OS is manageable through APIs which are written in the Java language.

Android comes with a set of apps for email, SMS messaging, calendars, internet browsing, contacts, and more. A third-party application can become the user's default web browser, SMS messenger, or even the default keyboard (excluding the system's Settings app). With the evolution of android operating system numerous new and innovative applications have appeared. Android applications like Remote Phone Access apk which deals with receiving SMS, call, phone contacts of remote mobile on email address from any other mobile prevent unauthorized access but need internet connection. Applications like shareit, xender enable android mobile users to share data but the distance between two mobile users is restricted. After analyzing the drawbacks of the existing applications and realizing the importance of mobile in everybody's life a new application named RMM is developed to cater the needs of the people in case mobile is forgotten.

This paper analyzes various existing methods of data sharing. This paper is organized as follows. Section I provides introduction. Section II describes related work. Section III illustrates RMM design. Section IV discusses implementation of RMM. Section V gives observation and conclusion. Section VI enumerates future scope.

II. RELATED WORK

A remote management system [1] is developed based on the client server architecture in which the server attaching the clients can access the clients through client interface management to change SELinux security policy in real time. A remote control system [2] has been developed which when installed on smartphones can be used to control remote computer system and access its peripherals, write data on remote computer, provide remote desktop etc. SMS and WiFi based system [3] is developed to control the security lights located at remote locations. It uses WiFi if the controlling device is in the WiFi range otherwise uses SMS to control the lights. NFC presented in [4] is used to transfer data up to few centimeters, hence can only be used for short range communication. It is one of the means of contactless data transfer. NFC reader enables remote identification of construction elements. Various systems like Rio [5] are developed to share I/O between mobile systems but no effort is made to retrieve data between mobiles from remote location. Using BTRC system [6] developed it is possible to use devices like

mobile phones as remote control. A number of applications currently exist to allow a user to remotely access computer via notebook computer or web page. Rajicon system [7] has been developed to remotely access PC using cell phone. Various applications are developed using android [8, 9] but there is need to develop application which can remotely access schedules, call, SMS etc. without internet connection when needed.

III. RMM DESIGN

Using RMM application user is able to access necessary features (Calls, SMS, Phonebook, Appointments & Schedules, and Files etc.) of his mobile remotely and securely. To cater these needs of the user, it has been assumed that user has another Test mobile at the end where he will access these features. User is able to send RMM commands to his personal mobile to activate required RMM application using a password. Once the User's mobile with RMM application receives the RMM commands, it decodes and interpret the command. The user's mobile should then activate the requested feature and deactivate all the feature remotely once he doesn't require the RMM (Remote mobile management) services anymore.

Once RMM application gets activated, it enables accessing necessary features (Viz. Calls, SMS, Phonebook, Appointments & Schedules, and Files etc.) of remote mobile securely from any test mobile. RMM application allows user to deactivate all the feature remotely once he doesn't require the RMM services anymore. Functionality of RMM application is shown in the use case diagram shown in Figure 2.

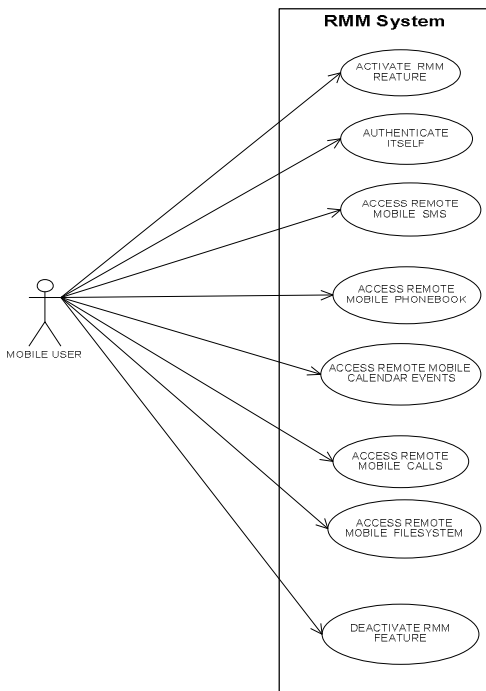


Figure 2: Use case diagram showing functionality of the RMM application

User can authenticate any mobile (test mobile) to android mobile with RMM application installed on it by sending RMM command. On successful authentication RMM application is started. RMM application then send commands for accessing the features (Viz. Calls, SMS, Phonebook, Appointments & Schedules, and Files etc.) to test mobile. Using these commands user can access the required features of the mobile with RMM application on any mobile (called test mobile). Timeout functionality is implemented while accessing the features. After timeout test mobile has to authenticate itself to the RMM application again. Once everything is done user can deactivate RMM application by sending command from the test mobile.

IV. RMM IMPLEMENTATION

First time RMM application installed on android mobile when opened asks for setting password for security purpose which is saved in the RMM PASSWORD database. Snapshot is shown in Figure 3.

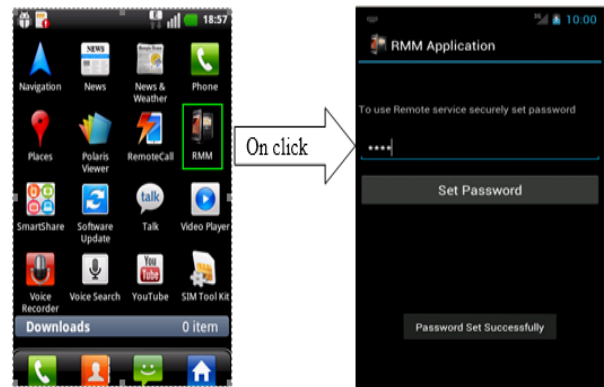


Figure 3: Snapshot showing setting of password in RMM application

Activities, Broadcast Receiver, objects, classes etc. provided by the android software development kit [5] are used.

Working of RMM application is as follows:

- i) Security for accessing features in remote mobile is provided in RMM application by authentication which will be based on password which will be verified whenever a command (RMM_ACTIVATE) for activating remote access features is received on remote mobile. RMM commands can be sent from any mobile (called Test mobile). On receiving RMM_ACTIVATE command RMM application will ask for password. On receiving password RMM application on the remote mobile verifies the password set in the RMM PASSWORD database, if it matches correctly, then the below mentioned action takes place as shown in the flow chart:

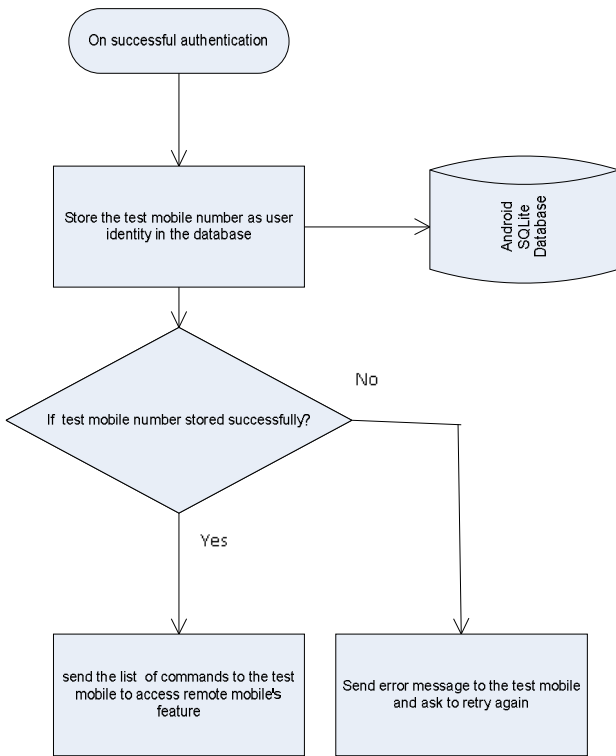


Figure 4: Flow diagram– Steps taken on successful authentication of the test mobile by RMM application on the remote mobile.

On successful authentication mobile number is saved in the database and RMM application send the list of commands to the test mobile as shown in figure 5.

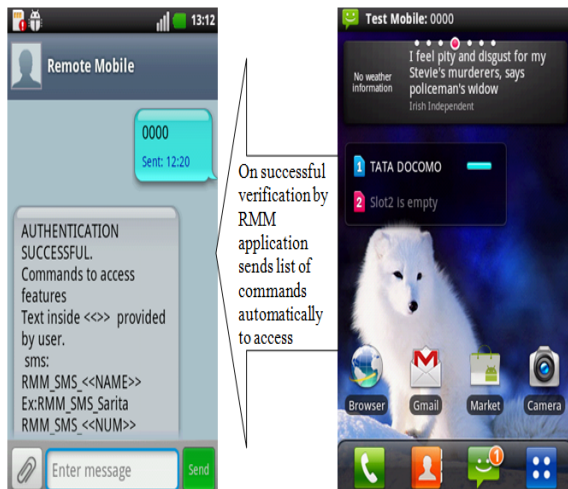


Figure 5: Snapshot showing sending of commands for remotely accessing various features

ii) Broadcast Receiver in RMM application continuously checks for any new SMS containing commands for accessing of RMM feature in the remote mobile. Commands shown in Table 1 are used for accessing the features of the remote mobile:

Table 1: Commands for accessing features for remote mobile

Command	Function
RMM_ACTIVATE	To activate remote access features on remote mobile
RMM_SMS_<<NAME>>	To fetch sms from the remote mobile received from the particular NAME or part of it
RMM_SMS_<<NUMBER>>	To fetch sms from the remote mobile received from the particular number
RMM_SMS_<<DD/MM/YY>>	To fetch sms from the remote mobile received on the particular date
RMM_PHONEBOOK_<<NAME >>	To get the required contact information of the corresponding name from the remote mobile to the test mobile
RMM_CALENDAR_<<DD/MM/YY >>	To get all the calendar events on the given date from the remote mobile to the test mobile
RMM_CALL_<<CODEFORCALLFORWARDING >>	To get all the calls from the remote mobile to the test mobile
RMM_FILESYSTEM_<<FILENAME>>	To get the required file from the remote mobile to the test mobile
RMM_DEACTIVATE	To deactivate remote access of the remote mobile features by the test mobile

iii) SMSReceiver class which continuously listens for new SMS containing RMM commands pass any RMM related SMS to SMSTracker which parse the RMM commands and redirect it to the appropriate code accessing the required feature of the remote mobile and respond to the test mobile. Processing for remote feature access on receiving SMS on the remote mobile by RMM application is shown in Figure 6.

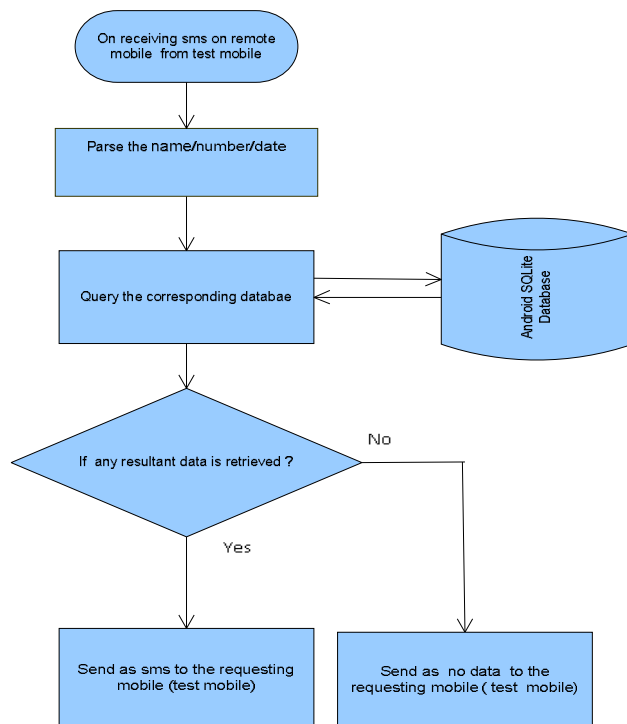


Figure 6: Processing for SMS, PHONEBOOK AND CALENDAR EVENTS features access on receiving SMS on the remote mobile by RMM application

iv) Once all remote feature access work is done user can issue RMM_DEACTIVATE command. On getting the command for deactivation of RMM feature test mobile identity (mobile number) which requested RMM feature activation is removed from the database, call forwarding is deactivated if it was enabled and the same user cannot access remote mobile features without authentication to the remote mobile again.

IV. ADVANTAGES OVER EXISTING SYSTEM

This RMM application is a single point using which we can easily access the features (Viz. Calls, SMS, Phonebook, Appointments & Schedules, and Files etc.) of the remote mobile very easily and securely. The RMM application developed using android platform is very useful for accessing remote mobile features when it is difficult to travel back for fetching the mobile by accessing the mobile features (Viz. Calls, SMS, Phonebook, Appointments & Schedules, and Files etc.) from any remote location. This application is also useful when the user has more than one mobile and he does not want to carry all the mobiles. User guide provided with this application helps the user to use this application. All care is taken for accepting user inputs and validating the user inputs. Verification of RMM application has been done on the handset with android platform.

V. OBSERVATION AND CONCLUSIONS

RMM application developed using android platform provides the virtual availability of the mobile which is not actually present with the user, since the user is able to

access all the important features of his mobile from any other mobile present with him .Using this application now there is no scope of missing important meetings, events, reminders, calls, messages, phone numbers, information regarding the person like home address etc. in case the mobile is forgotten. So this application is boon for all the android mobile users as the compulsion of carrying the mobile is no more a restriction.

VI.FUTURE SCOPE

The RMM application may be enhanced to provide full SMS and phonebook database to the test mobile.

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