

Track My Child

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Abstract— For any parent the most important thing is the safety of their child. This project aims to provide some safety to children. This paper provides to describe all technologies used in the project briefly, thereby explaining their use and increasing the performance of project. This project is an android application that provides various features to parents which helps to reduce their burden by efficiently communicating with school database. It provides an opportunity to continuously track their child's location, view important notifications and circulars sent from school send queries to teachers, view their child's information.

Index Terms—Android, GCM, Google Maps, GPS, Hibernate, Rest services.

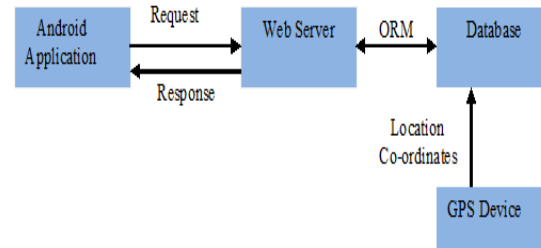


Fig 1: Architecture

I. INTRODUCTION

This project uses different technologies to develop an android application that makes it efficient for communication between parent and school. School is a place where children spend most of their time and require some protection as it is not possible for a parent to be present with their ward continuously. This application uses Google Cloud Messaging (GCM), Google maps, Hibernate, Rest services, Object Relational Mapping (ORM).

II. ARCHITECTURE

Child has a device which has a GPS chip inserted in it. The device continuously sends its co-ordinates to school database. The android application sends request to the server requesting for child's current location, the server then sends a response to the application. The server communicates with school database using object relational mapping (ORM). The response from server to application is sent in the form of JavaScript Object Notation (JSON). Json is a data interchange format that is derived from JavaScript. It is lightweight language-independent data format, to transfer data between server and application. Gson is an open source Java library to convert Java objects to/from JSON.

III. IMPLEMENTATION

The different features provided by the application are as follows:

A. Location

The server sends the co-ordinates to the application these are viewed on the Google map. Google maps use a dynamic presentation tool and provide well-known map service to locate the child easily and quickly. It provides clear maps that are easy to understand by the parents. Parents can be provided with a feature called geo-fencing where certain locations are set by them and when their child enters that location a notification is sent immediately to the parent. Also another important feature is calculating the speed with which the child is travelling and sends a notification when the speed exceeds a particular speed limit. These maps are accurate and show real time child movements information.

B. Parent Teacher Organization

The chat feature provided allows the parent to send a message to the class teacher in offline mode. That is when the teacher is busy the parent can send their queries to the teacher. The teacher can reply to the messages whenever she finds time.

C. News And Circular

The news and circulars from the school are sent to the application and displayed in the form of list view. The pull method is used to access the web service. The application hits the server and collects the data from the database this method reduces the performance of application.

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D. Notifications

The messages related to a particular student can be sent to the parent using notification service. The notifications are pushed on the application using Google Cloud Messaging (GCM). GCM enhances user experience and saves lot of battery life. When the polling method is used to access any service, a service class is created which runs for indefinite time and the device continuously checks for any update at regular interval. This soon causes the application to lower its priority and service class dies, this greatly reduces the performance and battery life. GCM is a free service made for android device that allows the developers to send data from server to device and doesn't require them to run continuously. The device sends the application id and sender id to the GCM server for registration.

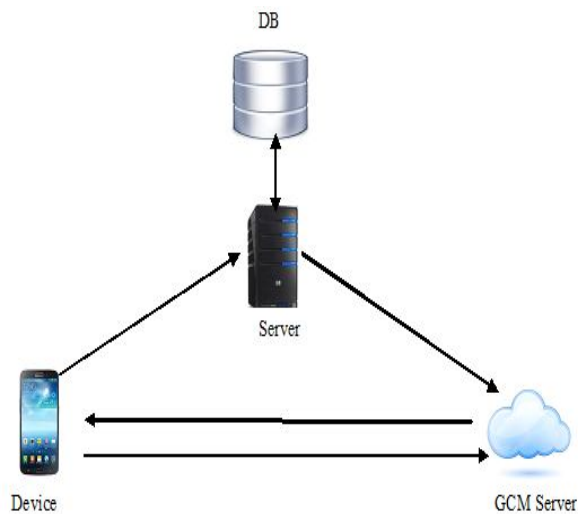


Fig 2: GCM Architecture

After successfully completing the registration the GCM server sends registration id to the device. This id is then sent to the server. When push message is to be sent, the server sends it to the GCM server along with the registration id. The GCM server then sends the message to the device. The GCM handles all queuing of messages it doesn't require the application to run always instead whenever the application is online GCM delivers the messages to the device. The delivered messages are then displayed as notifications using the notification manager.

E. Profile

The student profile containing his name, roll number, contact number, address, etc is displayed. An additional facility can be provided to the parent to make changes to the student profile.

VI. SERVER AND DATABASE COMMUNICATION

The server interacts with database using the concept of Object Relational Mapping (ORM). Hibernate is a framework that is inserted between the application and database that performs ORM. It makes the project independent of any database used by the school. It interacts with queries as objects and performs mapping from objects to relational database.

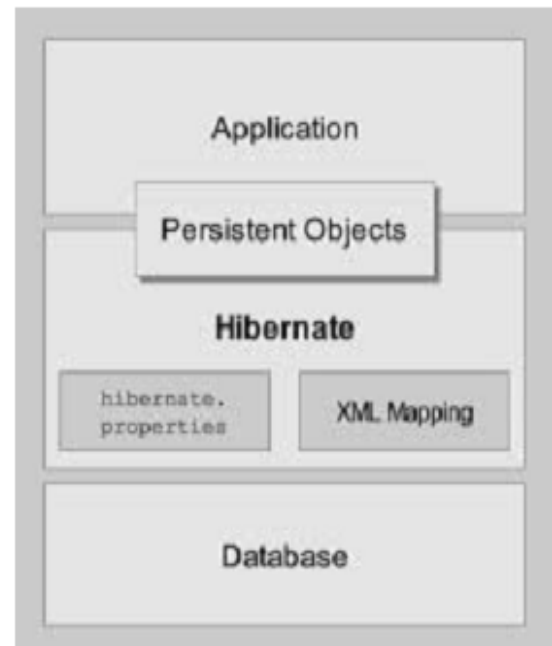


Fig 3: Hibernate Architecture

V. CONCLUSION

GPS is a useful device that is used in different applications. Thus using GPS we have developed an application that tries providing some kind of safety to the children in school and this should be implemented in all schools. This project can be extended to desktops, the drawback is that it is limited to smart phones.

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