

## Off Line Enabled GPS Tracking

Sanjay K<sup>1</sup>, Ram Ratheesh Rao P R<sup>2</sup>, Praveen Kumar V<sup>3</sup>, J. Umamageswaran<sup>4</sup>

<sup>4</sup>(AP), <sup>1,2,3,4</sup>Department of Information Technology, R.M.K Engineering College

<sup>4</sup>jum.it@rmkec.ac.in

**Abstract:** The primary objective of the project is to track the client location through GPS information obtained from the client when tracking is turned on in the client's mobile application. There exist many such current systems that provide GPS tracking, but fail when the network connectivity issue arises as the device will be unavailable to send the location data to the server. One of the prime features of the product is to overcome such a drawback of network issues. Our project aims to enable the tracking even when the device goes offline at certain times. The client will have an android application installed on their mobile phones and the application will send periodic GPS Coordinates to the server and save it in the database. The front-end encompasses of Google maps API which plots the coordinates on the map to provide a visual representation of the user navigation.

**Keywords:** Global Positioning System (GPS), API, PHP, JavaScript.

### 1. INTRODUCTION

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil, and commercial users around the world. The United States government created the system, maintains it, and makes it freely accessible to anyone with a GPS receiver. As of 2009, military GPS applications include:

**1. Navigation:** Soldiers use GPS to find objectives, even in the dark or in unfamiliar territory, and to coordinate troop and supply movement. In the United States armed forces, commanders use the Commanders Digital Assistant and lower ranks use the Soldier Digital Assistant. The United States government created the system, maintains it, and makes it freely accessible to anyone with the process.

**2. Target tracking:** Various military weapons systems use GPS to track potential ground and air aims before flagging them as aggressive. These weapon system pass targets coordinate to precision-guided arms to allow them to connect targets accurately. Military aircraft, particularly in air-to-ground roles, use GPS to discover targets (for example, gun camera video from AH-1 Cobras in Iraq show GPS coordinates that can be viewed with specialized software).

**3. Missile and projectile guidance:** GPS allows accurate targeting of various military weapons, including ICBMs, precision-guided, cruise missiles, weapons and Artillery projectiles. Embedded GPS receivers able to withstand accelerations of 12,000 g or about 118 km/s<sup>2</sup> have been developed for use in 155-millimeter howitzers. Search and rescue: Downed pilots can be situated faster if their position is known. GPS satellites carry a set of nuclear detonation detectors comprising of an optical sensor (Y-sensor), an X-ray sensor, a dosimeter, and an electromagnetic pulse (EMP) sensor (W-sensor), that form a major portion of the United States Nuclear Detonation Detection System. General William Shelton has declared that future satellites may drop this feature to save money.

### 2. DESCRIPTION OF THE PROPOSED SYSTEM

The Proposed system consists of a PHP server and a MySQL backend database server. The client is provided with an Android application which connects to the PHP Server using a tracking id and a password and sends periodic data to the server which is stored in the database. The project also included a web application which is used to visualize the client tracking data. On login, the users can view the tracked GPS data on the map. The coordinates are fetched from the web application and displayed on the Google maps using JavaScript API. The users can only view their tracking data, whereas an admin of the system

can view the details for all the users in the system using a search feature , which returns the tracking id of the user that is going to be tracked. The admin can view the Gps details for all the users who have registered in the system.The android client also includes an sign up or register form which allows the users to create an account in the system. The web application also includes a similar system.

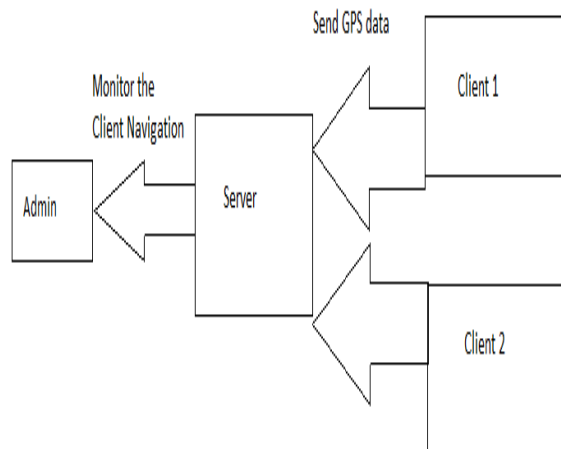


Figure 1.1 System Architecture

### 3. IMPLEMENTATION AND MODULES

#### PHP Server

The backend consists of a php server as mentioned in the introduction .The server is run on Apache with php installed. The Database used is MySQL v5.0.1The database configuration details are contained in the dbconfig.php script with the user name and password of the Database All requests from the Application are routed to the index.php file with a tag field which contains the request type .Based on the tag field the server invokes corresponding functions from the file dbfunctions.php .Such as , for login , the tag is login , Hence a function for login from the dbfunctions.php file is executed which verifies the user id and password from the database .Register function checks whether the user is already existing in the system and if not , inserts the data in to the database .The password of the user is Encrypted using php hash sha functions before storing into the database.Each user has a unique id which is set as an auto increment variable in the database of the users .The php script for fetching the data from the database is in the function getlocation(),which takes the id as a parameter and sends the array of locations to the application in Json

format. The application receives the J son object and creates a marker for every location coordinate returned from the database server. PHP sessions are used to track the current user logged into the web application,On Login , the session variable is set to the username and the tracking id , When the maps are being loaded , the session variables are used to select the user data from the database .On Logout , the session is ended and the variables are destroyed to avoid misuse.The front end of the web application consists of Google maps JavaScript API

#### Google Maps JavaScript API v 3

The front-end of the system consists of Google Maps to visualize the Location coordinates of the user in the database.The html page consists of JavaScript which implements the API provided by Google in its documentation.

The JavaScript functions invoke the php functions which echo the coordinates data from the database. The echoed' data is then plotted on to the maps using the map variable . For each coordinate echoed from the php , a Marker is created on the google map. An AJAX post request from the JavaScript to the database refreshes the markers periodically , about 10 seconds , to load markers that are updated into the database newly. The post response from the php is a J son Object that is parsed in the Javascript to extract the coordinates from the response.

#### Android Application

The Client side is an Android Application which plays the main role in this project , The Offline feature is enabled through the Andorid applicaiton using its Broadcast receivers. The launcher activity of the application consists of a login screen , which on click invokes the index.php page with a tag "login" .The server validates the login and replies to the application.New users can register through the Register Activity which invokes the index.php with a tag "Register ". The php file inserts data to the database and returns true to the application which redirects to the login page.On successful login , the Main Activity of the application performs the work of Sending GPS data to the server periodically. The GPS data is read from the GPS receiver. The broadcast receiver in android reports whether data connectivity or Wifi connection is available .If connection is available , the GPS data is sent to the server through post method to the php script storedata.php. The

application simply queues the data into a Queue and dequeues it to post data to the php server. The script adds the data to the database and returns true. In Case the data connection is unavailable. The post to php is postponed until connection is established. The loop runs on a separate thread infinitely for every 5 seconds with the thread sleep function. Thus the GPS data when the data connection is unavailable is also passed onto the server using the queue. Thus , an offline tracking is enabled .

#### **4. CONCLUSION AND FUTURE ENHANCEMENTS**

The proposed system implemented and tested in Android application , the very next step would be to develop applications in iOS and Windows platform to launch the product to public. The testing has been done only on an development environment and real time beta release is yet to be released. As for now, the admin access is given only from the web application, which should be extended to android as well as other platforms in the near future. The main aim is to release the application to the general public as a cross –platform GPS tracking application.

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