Preserving Privacy of Location Based Services

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ABSTRACT- *The existing Location Based query provide services to user but it does not protect user information from the intruders and the Google API does not want to simply distribute its data to all users. We propose a major enhancement upon previous problem by introducing Open Authentication (OAuth) model using Facebook for an open environment to combine the trusted module security and platform trust in federated user systems. We implement over solution on desktop machine and mobile device to assess the efficiency of our application. We also implement a high configure server machine which is Trusted Third Party (TTP) Server. User can securely access various services from Google API through TTP server.*

Keyword: **Location based queries, Open Authentication, TTP server implementation, Cryptography, Private information retrieval**

1. INTRODUCTION

Location Based Services are information services accessible with mobile devices through the mobile network and utilizing the ability to make use of the location of the mobile device.A Location Based Service (LBS) is an information, entertainment and utility service generally accessible by mobile devices such as mobile phones, GPS devices, packets PCs, and operating through a mobile network. A LBS can offer many services to the users based on the geographical position of their mobile devices. The service provided by a LBS are typically based on a point of interest database. By retrieving the Points Of Interest (POIs) from the Google API ,the user can select type such as Hospitals, Petrol pump add so on and send query to TTP sever. TTP server forward this query to the Google API, which include but are not limited to-discovering the nearest ATM machine, government offices, gas station, hospital or police station[6].

2. NEED OF PROJECT

In recent years there has been a dramatic increase in the number of mobile devices querying location servers for information about POIs. Among many challenging barriers to the wide deployment of such application, privacy assurance is a major issue. Today's existing system works as open source. Anyone can access location based services using different location searching tools and devices. But this desired system does not directly deals with the Google API it go through TTP server, hence system managed to respond only authorized location based services accessing users. Also this system managed to control traffic towards the LBS.

As desired system is included with Open Authentication, we can surely claim that no any single unauthorized user can reach up to Google server. Various algorithms used for encryption and decryption to protect transmitted data. Soul of our system is providing security for client info and server information as well, also preserving privacy of user's valuable data and to protect transmitted data.

3. SOFTWAREREQUIREMENT SPECIFICATION

3.1Software Requirements:

-Operating System- Windows 7

-Language**:** Java,.net, Ajax

-Microsoft SQL server 2008

-Rest Client

-Connectify me

-Visual studio 2012

-WCF framework

3.2Hardware Requirements:

-8GB RAM

-Hard disk: Min:20GB & Max1TB

-Processor: Intel Processor

-Smartphone

4. BROWSER SUPPORT

1) Firefox: version 4 and up
2) Google Chrome: any version
3) Internet Explorer: version 8 and up
4) Android: 4.2 and up

5. RELATED WORK

For the security concern we implement the high configuring Trusted Third Party (TTP) server and also create Smart Locator application for accessing location easily.

Preserving Privacy of location based service consists of two modules those are:

1) Android application
2) TTP server implementation

5.1Android application:

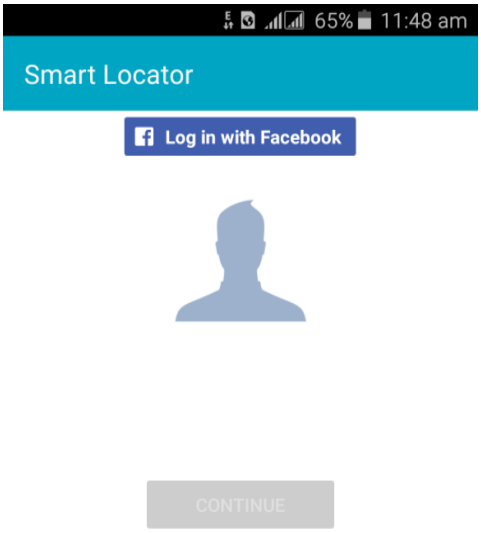

Fig. 1 Facebook control

After opening the application user select Login with facebook button, then process is continue and control go to facebook login.

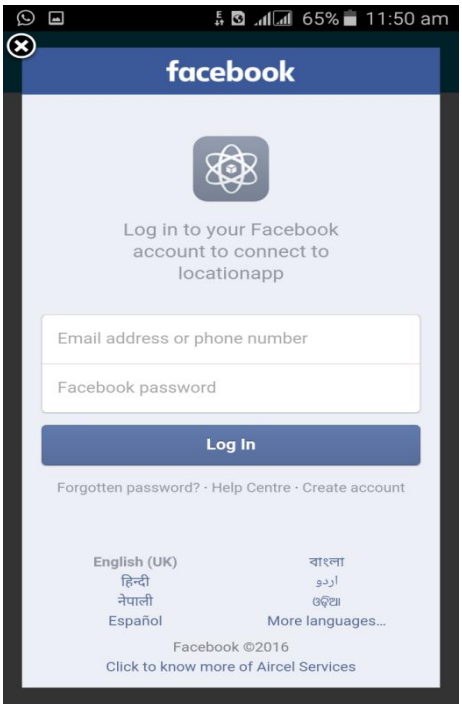

Fig. 2 User Login with facebook

In this user can enter email address and password and log in successful. If the email address or password is incorrect it display message.

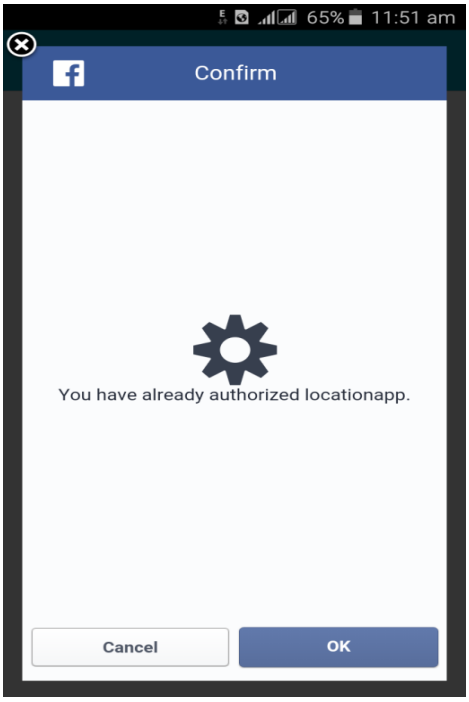

Fig. 3 Confirmation form

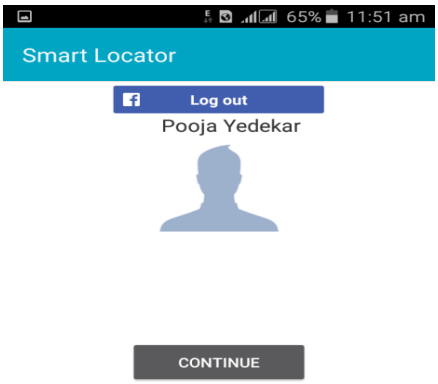

Fig. 4 Check validation

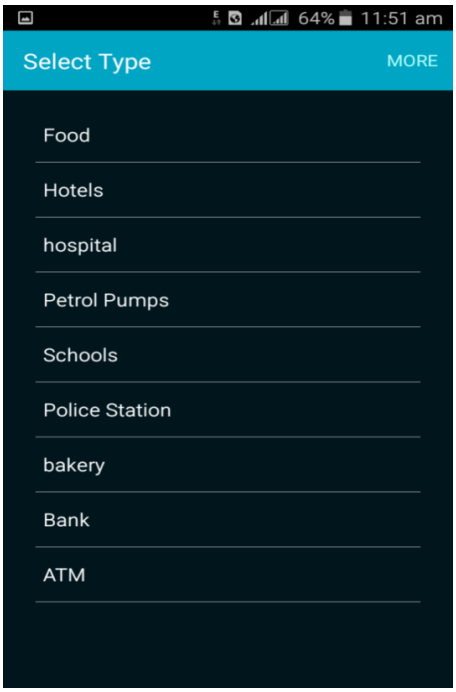

Fig. 5 Service select by user

Service select page contain number of services such as Food, Hospitals, Schools, Bank and so on. User canselect one of the service then proceed.

Fig. 6 Map plotting

After selecting service type it display number of Point of Interest (POI).

5.2 TTP server implementation:

Trusted Third Party server is highly configuring machine. It is locate on any locally or remotely machine at the back end. It contain all control of facebook and Google API connection,for communication between smart locator application and TTP server; it uses the Connectify me software.It contain two main function such as getUserRegistration and getLocation. The getUserRegistration function contain related link of Facebook connection, this is used because only authorized user can access the services.In the getLocation function the TTP server pass the control to Google API for retrieving multiple nearest location related to particular service. It also contain one table (UserInformation), it store all valid user information with base64 encoding technique.

6. SYSTEM DESIGN

6.1Architecture:

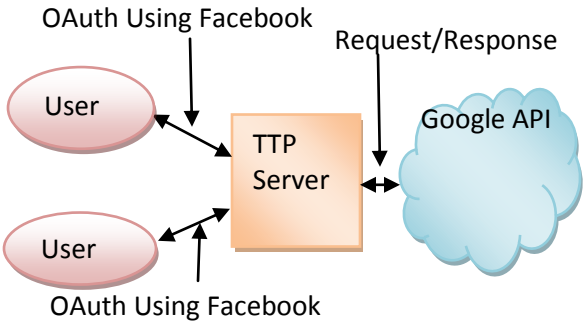

Fig. 7 Architecture Diagram of LBS

6.2Technology:

Number of technology used in developing AJAX(Asynchronous JAVA script), JSON(Java Script Object Notation), JQuery, ASP.NET.

1) AJAX:

Ajax(asynchronous JavaScript and XML)is a set of web development techniques using many web technologies on the client-side to create asynchronous web applications. With Ajax, web applications can send data to and retrieve from a server asynchronously without interfering with the display and behaviour of the existing page [3].

2) JSON:

It is used while writing JavaScript based applications that includes browser extensions and websites. JSON format is used for serializing and transmitting structured data over

network connection. It is primarily used to transmit data between a server and web applications.

3) JQuery:

jQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler with an easy-to-use API that works across a multitude of browsers. With a combination of versatility and extensibility, Jquery has changed the way that millions of people write JavaScript. JQuery make it easy to respond to user interaction with a web page.

4) ASP.NET:

ASP.NET is an open source server-side web application framework designed for web development to produce dynamic web pages. .NET Framework, and is the successor to Microsoft's Active Server pages (ASP) technology. ASP.NET is built on Common Language Runtime (CLR), allowing programmers to write ASP.NET code using any supported .NET language.

5) Visual Studio 2012:

The Visual studio 2012 Product Guide provides a comprehensive overview of scenarios and regarding:

- The new integrated development environment (IDE)
- Web development
- Cloud development
- SharePoint development
- Application Life Cycle Management tools

Visual Studio 2012 makes it easy to develop applications for multiple platforms, including Windows Phone Smartphone's, slate devices running Windows and of course on traditional desktop computers [2].

6) Microsoft SQL server 2008:

A database server, it is a software product with the primary function of storing and retrieving data as requested by other software applications which may run either on the same computer or on another computer across a network.SQL Server 2008 also includes support for structured and semi structured data, including digital media formats for pictures, audio, video and other multimedia data[4].

7. IMPLEMENTATION

We have implemented TTP server by using C# as front end and Microsoft SQL server as back end. TTP will mounted on cloud. The Application eve loped using Ajax & JQuery. JSON is used for Exchange data between user, TTP Server and Google API.

8. ADVANTAGES AND DISADVANTAGES

8.1Advantages

1) It provides protection for both the user and the server data though encryption and decryption technique.
2) It required less time for accessing location.
3) Secure Data Access Mechanism.
4) Convenience and continuous availability.
5) It is platform of user friendly with reliable access.

8.2 Disadvantages

1) It requires internet connection for Smartphone.

9. APPLICATION

This system is majorly applicable and beneficial for government services, police departments, military applications and citizens as well.

10. RESULTS AND ANALYSIS

In this section, we analyse the privacy of the client and the server. While the client does not want to give up the privacy of his/her location, the server does not want to disclose other useless records to the client. We now analyse the performance of our solution and show that it is very practical [6]. The results of performance solutions are very positive and impressive. Results and analysis of our application has successfully achieved the desired goals of our entire problem statement.+

11. FUTURE WORK

Future work will involve implementing this service to various technical environments and viewing results for making service better to use. We desired to work on image, voice navigation.

12. CONCLUSION

This system ensures maximum privacy to the location based services. Firstly system prioritizes to keep current location of user secured. Strong open authentication allows only verified users to access LBS. TTP server maintains users verified information so in case we can track any user for his/her misguide and misbehaviour. We manage to improve location based system operations to make more reliable, efficient, scalable and secured data integrity.

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