Location-based Services

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Abstract

Considering the recent convergence of information and telecommunications technologies, the next revolution after the success of the Internet and the World Wide Web is expected to be the Mobile Web. The main promise of the Mobile Web is to cover user needs for anywhere- anytime access, leading us to Location Based Services (LBS).

The purpose of this thesis is to give a thorough overview of Location Based Services, review multiple positioning techniques in modern wireless telecommunications networks and present a location server simulator as well as a simple location based service. The technologies adopted as part of this thesis are well known for being open standards. They have been accepted by the industry and successfully meet the requirements of scalability and managing autonomy for the service proposed here.

Location Based Services are services, which use the positioning information about a mobile device in order to offer more personalized information. The positioning information is useless if it is presented to the user as a raw set of coordinates. It has to be combined with other information to become valuable to the user. This kind of combination of information is exactly the main purpose of LBS. There are some LBS categories: Public Safety Services, Location Based Charging, Tracking Services, Enhanced Call Routing, Information Services, and Advanced Network Services. Each one of these services poses different positioning accuracy requirements. The main positioning techniques in modern cellular telecommunications networks are: Cell Global Identity (CGI), Cell Global Identity Timing Advance (CGI- TA), Enhanced Cell Global Identity (E- CGI), Time Of Arrival (TOA), Observed Time Difference Of Arrival (OTDOA), Observed Time Difference (OTD), Enhanced Observed Time Difference (E- OTD) and Assisted GPS (A- GPS). Each one of these methods offers different positioning accuracy. The cost for deploying such a technique depends on the tec hnique's accuracy.

There are many important technologies involved in positioning today and in the future. The major technologies identified in this thesis are SIM, WAP, GPRS, UMTS, other software and gateway technology, and aerial-technique.

There may be some social and political consequences because of mobile positioning being the most important personal integrity. This must be discussed and researched further.

The likely development of positioning techniques in the future is a more standardised solution, probably available in the networks when they are built, more accurate positioning, an open API, terminals with both GPS and GSM- positioning. It is hard to say which specific technique for positioning will prevail, but there will be a high demand for location- based services.

The future of location based services and mobile positioning, as a whole looks very bright.