6WINIT - IPv6 Wireless Internet Initiative

Indoor Navigation Using WLAN 802.11 Positioning
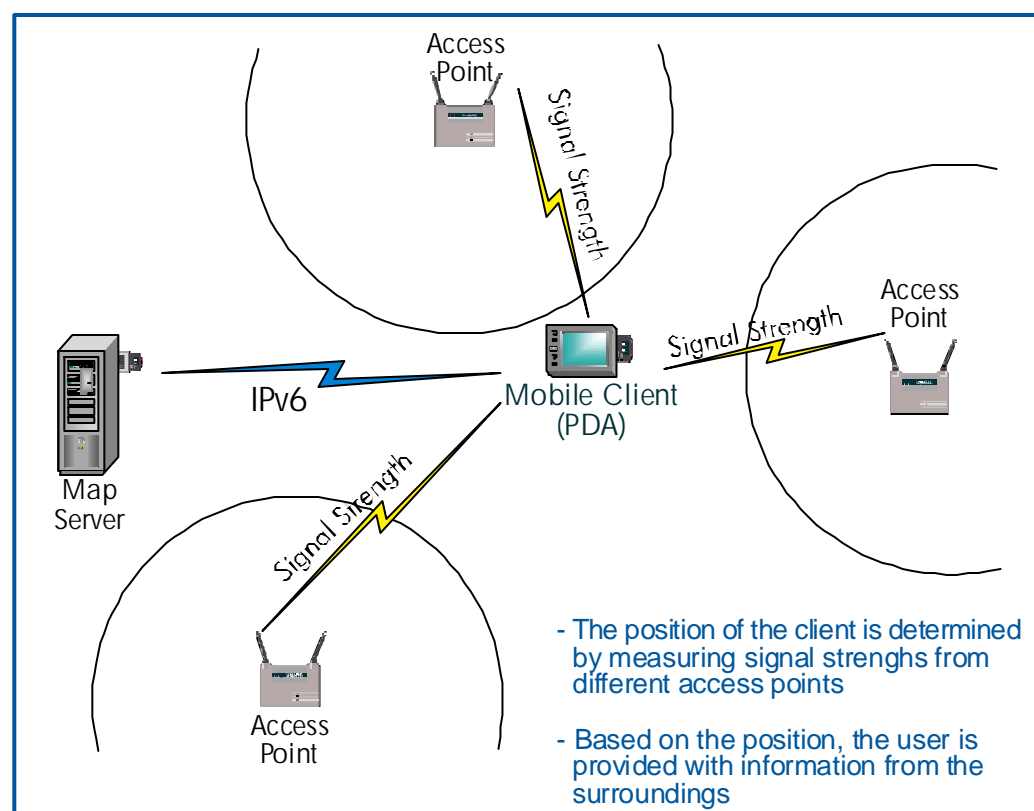
6WINIT Project Overview

The 6WINIT project will validate the introduction of the new wireless Internet in Europe - a combination of the Internet protocol version 6 (IPv6) and wireless networks. The project will provide a number of testbed applications. VTT has three different testbeds: areal spatial information in mobile application, weather station, and home environment.

Areal Spatial Information in Mobile Application (ASIMA)

Many computerised aids have been designed in order to help people to navigate in places they don't know. However, these often have limitations: widely used GPS positioning is not fully functional indoors and the information delivered to the user is static and possibly out of date. By using WLAN for positioning and data transfer, a mobile user is able to get dynamically updating information which helps him to find what he is looking for also indoors.

WLAN Positioning

WLAN positioning is based on received signal strengths. The signal strengths in the WLAN coverage area are measured beforehand and stored to a database from as many points in the demonstration area as possible. The position of the mobile client can then be determined by measuring signal strengths from three access points and comparing the data with the signal strengths in the database. Maximum distance from each access point and the previous positions of the client are compared to the current position which limits the search to the right area.

Access Point

Signal Strength

Access Point

Signal Strength

Mobile Client (PDA)

IPv6

Map Server

Signal Strength

Signal Strength

Access Point

- The position of the client is determined by measuring signal strenghs from different access points

- Based on the position, the user is provided with information from the surroundings

Technical Information

Network	- IPv6 protocol - 802.11 WLAN (3 fixed access points)
Client	- a regular web browser, and - signal strength measurement
Server	- determines the position of the client and generates the map - data is served through a regular web server

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The WLAN positioning part has been developed in VTT Electronics' Interactive Intelligent Electronics Programme *(http://www.iie.fi/)*. The ASIMA application is developed in co-operation with MGPosition Ltd (*http://www.mgposition.com/*).

IPV6 FORUM

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