

# LOCATION BASED SERVICES

## SECURITY CONSULTANCY

### BACKGROUND

Context-aware computing describes applications, often implemented for mobile devices that adapt to environmental sensor information. Location-based services are the most common form of context-aware computing.

There are two types of location based services: (i) *location-tracking services* that are based on other parties tracking the user's location and, (ii) *position-aware services* that rely on the device's knowledge of its own location. Examples of LBS applications include navigation (directions, traffic control), information (travel and tourist guides), tracking (people, vehicle or product tracking), emergency (police, ambulance), advertising (advertisement alerts), billing (road tolls), device settings (updating the time when entering a new time zone ) and social networking (locating friends, instant messaging).

Location-based services are made possible by either incorporating a GPS receiver in the mobile device or through location database providers such as Skyhook, Google, and Apple. These companies maintain a reference database of Wi-Fi MAC addresses and Cell tower IDs that they collect by, among other ways, scanning the streets for such equipment. Mobile devices such as smartphones and laptops send their raw position information (Wi-Fi AP/Cell tower ID, signal strength, etc.) to a provider, who uses triangulation schemes to estimate and return the location (latitude, longitude, and accuracy) to the device. Thereafter applications on the device can request user permission to access this information and send it to servers on the Internet that provide some service to the user.

### SECURITY & PRIVACY CONCERNS

While location information has enabled the delivery of interesting services, it has also raised security and privacy concerns. For example:

- Social media applications allow users to share their location with friends and businesses (that provide value-added\_services). But at the same time, they expose users to serious security issues such as the ones on [PleaseRobMe.com](#) and [ICanStalkYou.com](#).
- Recently, concerns were raised by the Military about the inadvertent release of sensitive unit location information on social media sites.
- In the Enterprise arena where users are increasingly mobile, organizations can benefit by using location data to manage mobile assets, but can also face risks from revealing location data of employees and resources to the competition.

It is also worth noting that a service, such as advertisement alert or travel and tourist guides may need to verify legitimate use, but may not need other personal information about the user requesting the service. Some services may need location information of the requester but not their exact identity, for example navigation and road tolling services. Other services, such as, people tracking and social networking, need both the identity of the user as well as their exact location.

The notion of privacy varies from one individual to another. One individual may be willing to disclose their location to co-workers while on vacation, whereas another individual may not want to do so. The other issue is the granularity at which individuals are willing to disclose their location information. For example, a person may be willing to disclose to his friends that they are in town on a particular day, but may not be willing to reveal their exact whereabouts.

## **CLIENT ENGAGEMENT**

The key question in location privacy is who should have access to what location information and under what circumstances(?) Moreover a policy is needed that allows different users to express their location privacy preferences and mechanisms for enforcing them. Advisec Ltd can assist in the production of such a policy document.

Production of the policy is however only step 1, and ‘success’ or otherwise will depend on the manufacturers of end-user devices, application providers and providers of location based databases providing the capability needed to implement such a policy. This will necessitate the production of a requirement specification for each body.

Finally there is a requirement to ensure that the implementation of policy cannot be undermined by security threats and vulnerabilities, and once again Advisec Ltd is available to undertake comprehensive risk assessments and provide recommendations for controls.

## **BENEFITS TO CLIENT**

Clients can be assured of high quality security advice provided by experienced security consultants, accredited under the CLAS and CISSP schemes.

## **FURTHER DETAILS**

Further details, including case studies, presentations and references are available from Nigel Strutt. Contact details: 07780 526195 or 01869 388011 (telephone) and [nigel.strutt@advisec.co.uk](mailto:nigel.strutt@advisec.co.uk) (email).