

Polaris Wireless Proposes Low-Cost Location Service to Japanese Network Operators

Polaris Wireless, a privately held Silicon Valley company is marketing a unique location technology for mobile, wireless handsets. Polaris's technology, Wireless Location Signatures (WLS), works best in dense urban environments and does not require any hardware investment. WLS meets the U.S. E911 public safety standard for mobile phones in the United States.

Since its founding in 1999, Polaris Wireless has operated from headquarters in Santa Clara, California. Its Chairman of the Board is Manlio Allegra, who also serves as President and Chief Executive Officer. The company owns seven patents for its location algorithms, and has filed for 17 other related patents.

On Sept. 29, the company conducted a roundtable presentation at Hotel New Otani in Tokyo, to explain its technology to Japanese business reporters and technical writers. Speakers included Thomas Wrappe, Senior Vice President of Marketing and General Manager for Asia; Akira Kawashima, Advisor of Japan Market Development and Dr. Joseph Ho, Director of Research.

Wrappe led the presentations, saying that WLS does not require any change to the handset hardware or software, and has a centralized server capability. Wrappe noted that Global Positioning System (GPS) services work best in so-called open sky environments, where population densities are relatively low and there are no tall buildings to block the GPS signal. On the other hand, WLS works very well in high-rise areas with large, dense populations. Therefore, WLS and GPS (especially Assisted GPS or A-GPS) complement each other quite well.

One of the biggest differences between GPS and WLS, says Kawashima, is that GPS requires the addition of an extra chip to every handset, and sometimes involves an extra antenna too. WLS works without any changes in handset design, network design, or hardware infrastructure.

“We’re just getting started here in Japan”, Wrappe acknowledged. “We respect and understand that Japan is a unique market. We respect and understand that we will be adapting this technology to the market in Japan”.

WLS works by knowing the signal strength of the radio frequency (RF) signals that each handset receives at each point along the network (fig. 1). Service providers first build a database (the Predicted Signature Database or PSD) of all the received RF signal strengths from each base station in the network (fig. 2). A distinctive combination of RF signal strengths identifies the RF signature of a specific geographic spot within the network (fig. 3). All the phones in the network

serve as probes, reporting their individual RF signatures in real time to the network server. The system has an accuracy of within 50m, and can detect a location in 10 seconds or less.

Thus, if handset A reports an RF signature of (-50, -85, -95, -70), the handset A must be in location 1. If two handsets report the same RF signature, it means two people are close to each other (within 50m) at location 1. Right now, the system works only in two dimensions (X and Y, flat plane), but additional technology refinements will enable WLS to identify individual locations along a Z (vertical axis) as well. In other words, it will be able to distinguish among different locations within the same skyscraper.

Wrappe says that WLS does not require induction loops or any other changes to the existing infrastructure. He estimates that WLS' total cost of ownership is about 50 percent lower than competitive location systems.

“The biggest investment for carriers is getting their network information together”, said Wrappe. “We also have to do a lot of data validation”. Thus, he says, the company can put together a trial system in about one month, but nationwide WLS deployment for any given service provider generally takes about a year.

The most obvious use of WLS location is in emergency services, where ambulances, firefighters and police must be able to find a caller's location quickly and accurately (fig. 4). According to Kawashima, the system offers a number of benefits to service providers. For instance, the ability to locate every phone in the network helps providers identify dropped calls. They can then use this information to optimize their network. Additionally, the detailed information about handset locations can help pinpoint spots where network upgrades will be most beneficial.

WLS also enable value-added services like zone pricing, road traffic monitoring, and selective advertising (fig. 5). In particular, says Kawashima, WLS has huge potential in regionally targeted push advertising (fig. 6), because there is an installed base of 80 million handsets in Japan. Unlike personal computers, those handsets are with their owners all the time, everywhere. Furthermore, the display screen is increasingly important in Japanese mobile phones, and is ideal for delivering advertising messages.

For now, though, Polaris is focusing on the first step of gaining a toe-hold in the Japan market. For at least the next six months, said Kawashima, “We have to focus on discussions with carriers”, and on explaining WLS technology to potential customers. According to Wrappe, the target customers include carriers, portal providers, and Internet service providers, as well as companies offering peer-to-peer and workgroup services.

米ポラリス、独自の位置情報技術で日本市場参入めざす

シリコンバレーに本拠を構える米ポラリス・ワイヤレスは、携帯電話や無線端末向けの独自の位置情報技術「ワイヤレス・ロケーション」の日本市場での可能

性を探っている。このほど来日した同社アジア担当ゼネラルマネジャーのトーマス・ラッペ氏、川島晃氏、研究開発担当ディレクターのヨセフ・ホー博士に、WLSの特徴と導入メリットについて聞いた。



アジア担当GM
のラッペ氏

高層ビルが林立する環境でも機能

GPSと異なり インフラ変更不要

WLS（全地球測位システム）は、米国の携帯電話向け公共安全規格「E9200」は、米国の携帯電話向け公共安全規格「E9200」が、信号を妨害する高い建物がなく人口密度も低い、いわゆるオープンスカイ環境で良好に機能するのに対して、端末に特別のチップや、時には特別なアンテナが必要だが、WLSは端末、ネットワークの設計、ハードウェア・インフラを何ら変更することなく利用できる、これが両技術の最大の違いであると強調。

10秒以内に特定

WLSは、ネットワーク内のそれぞれの地点で各端末が受信する無線周波数（RF）信号の強度を認識することで動作する。サービスプロバイダは初めて、

川島晃氏、研究開発担当ディレクターのヨセフ・ホー博士に、WLSの特徴と導入メリットについて聞いた。

GPSと補完関係

一般的に利用されている位置情報サービスのGPSと異なり、WLSは人口密度が高層ビルが林立する環境で非常によく機能するのが特徴で、双方は完全に補完関係にあるとラッペ氏は説明する。

川島晃氏、研究開発担当ディレクターのヨセフ・ホー博士に、WLSの特徴と導入メリットについて聞いた。

一般的に利用されている位置情報サービスのGPS

また川島氏は、GPSを利用するためにはすべての

サービスプロバイダは初めて、

内、10秒以内に位置を特定できるという。（つづく）