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Overview of 802.11 RTLS Vendors

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The campus-based real-time location system (RTLS) market will grow from less than \$20 million today to more than \$1.6 billion in global revenue by 2010. The market is entering a higher growth phase broadly powered by rising enterprise Wi-Fi deployments and improving active RFID technology. This activity has created an inflection point in the RTLS market.

The companies serving the market are segmented by technology into systems using 802.11 components and those using alternative unlicensed spectrum-based components. A further distinction resides in the underlying location-determining technology, which in part influences the addressable vertical markets these companies target. Several young companies with compelling technologies and a rapidly expanding customer base serve this market: AeroScout, PanGo Networks, Radianse, RF Code, Ekahau and WhereNet lead the way.

For more background, the overall market drivers for campus-based RTLS were explored in our previous *The Active RFID Market, Part 1* article, and RTLS market opportunity forecasts were made in *RTLS Market To Exceed \$1.6 Billion by 2010*.

Several Approaches, One RTLS Market

The first RTLS vendors were founded in the late 1990s based on emerging WLAN technology. With the ratification and subsequent success of IEEE 802.11, a new crop of competitors emerged that based solutions on the open standard. The former group generally uses unlicensed spectrum (408, 433, 900, etc.) for tag-to-reader air interface, which are referred to as "legacy" for the purpose of this article. The latter group developed systems based on IEEE 802.11 on the tag-to-access point air interface, which we refer to as simply "802.11." It's important to note that 802.11 tags can communicate with 802.11 access points (APs) directly. However, legacy tags require additional reader hardware infrastructure to communicate. The difference amounts to a cost advantage of 802.11 systems over legacy systems because generally the greater the operational area covered (e.g., square footage of the building, yard), the more hardware costs scale.

Today's RTLS vendor solutions use two location-determining techniques:

Time difference of arrival (TDOA) refers to the AP's received timing differences of the device's signal.

Received signal strength indication (RSSI) as it sounds refers to a device's signal strength measured by the access point.

RSSI performs better in indoor walled environments (e.g., hospitals and distribution centers), while TDOA has advantages in unobstructed, outdoor environments (e.g. shipping/trucking yards, airplane manufacturing hangars). Pairing the proper technology to the correct environment ensures more consistent performance, limits system development costs and provides adequate mitigation of obsolescence risk.

Three 802.11 RTLS Vendors

Three 802.11 RTLS vendors compete in the market today: AeroScout, Ekahau and PanGo Networks. All three are mid-stage startups that have operated for less than five years. These young companies count less than 100 employees each, are headquartered in the United States and are giving the legacy vendors (covered in tomorrow's article) a run for their money.

AeroScout

Aeroscout's market strategy delivers an end-to-end product solution for most vertical markets needing asset tracking solutions. AeroScout, by offering proprietary and partnership-based solutions by changing location engines and continuing to use their proprietary tag, is unique among the RTLS vendors in this regard. For outdoor environments, AeroScout Engine 3.0 uses TDOA location determining technology. Aeroscout has partnered with Cisco for more multipath indoor environments to use its Location Appliance offering from the Airespace it offers CSSI based solutions. Consequently, it can satisfy mixed customer tracking requirements that includes indoor and outdoor environments and thus a larger available market.

Another distinction AeroScout has over its 802.11 rivals is its ability to enable perimeter security and gating applications. AeroScout Exciter is a hardware component that allows active RFID tags to trigger events based on proximity.

Ekahau

In operation since 2000, Ekahau offers a stand-alone RTLS solution for asset and people tracking. Ekahau is an 802.11 RTLS shop that claims its technology is the frontrunner in accuracy. From a product perspective, Ekahau is similar to Pango Networks. Both vendors implemented software-only systems, which limit their ability to supply gating functionality (choke points) used in many

shipping/receiving or physical perimeter security applications. Yet Ekahau has a presence in various markets, such as healthcare, logistics and process and discrete manufacturing. The majority of its customers track object assets, not people.

Built around a proprietary location determining technology, Ekahau Position Engine 3.1 (EPE) provides a compelling implementation. It achieves as little as 3.5 feet accuracy variance compared with Cisco Location Engine, which can exceed 20 feet. The significant difference in accuracy effectively enables accurate item-level tracking versus room or zone-level tracking. This capability will provide a competitive advantage as accuracy requirements increase through new use cases and greater tracked asset density per site.

PanGo Networks

PanGo Networks (PanGo) embraces the notion that campus-based location technologies will integrate across the IT infrastructure as a core enterprise application technology. PanGo is uniquely positioned to its competitors by separating the RTLS system and an application platform for back-end integration and application development.

The enterprise software platform moves the company closer to RTLS middleware vendor status from its current status as a pure-play RTLS vendor. PanGo brings it together with the PanOS Platform. It combines location technology, console management, device management and SDK with robust API's for backend integration to third-party vendors or enterprise application integration. As an emerging middleware platform, PanOS Platform aims to serve up location information to multiple enterprise applications and potentially across many RTLS technologies.

Buttressing PanOS is the PanGo Locator software that does the heavy lifting location determining work. As part of the core asset tracking product, the software package includes server and client modules and user interface for the asset tracking application. PanGo offers a similar product solution to its 802.11 brethren Ekahau and AeroScout. Like Ekahau, PanGo relies on RSSI location-determining technology and lacks choke point hardware, which limits its ability to meet some applications' requirements. Through partnerships, this product gap could become a non-issue.