High Accuracy Indoor Positioning - Technology Solution and Business Implications

Presentation for
3rd Invitational Workshop on
Opportunistic RF Localization for Next Generation Wireless Devices

Jukka Rantala
Nokia Research Center
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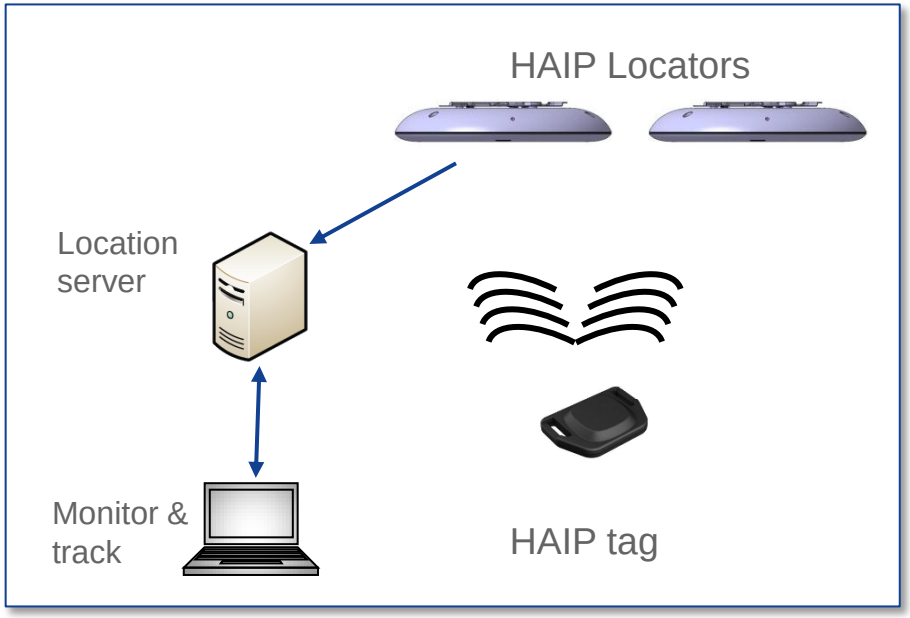
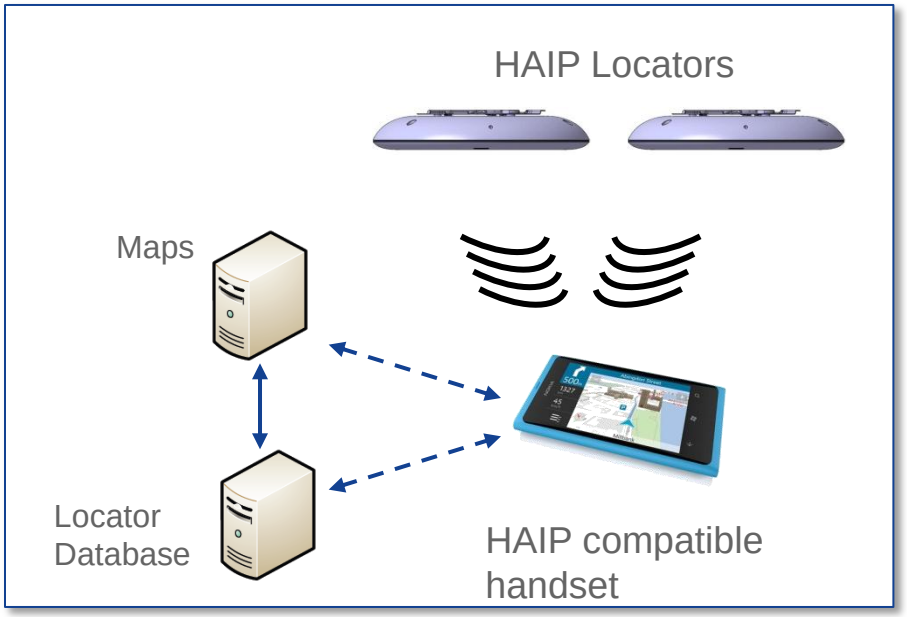
HAIP technology overview

- High Accuracy Indoor Positioning (HAIP) is a location enhancement for Bluetooth Low Energy (BLE) technology – standardization of the feature to be completed in 2012
- HAIP achieves 0.5m to 1m location accuracy (up to 10cm possible)
- HAIP Locators are typically ceiling-mounted and may work as receivers and/or transmitters depending on operational mode
- HAIP outperforms other systems in terms of optimal combination of accuracy, latency, capacity, power consumption, robustness, privacy, and cost of deployment

Network centric: localization of RF tags



Mobile centric: positioning using mobile phones



HAIP Market Position

- Offers high accuracy and low power consumption with consumer electronics compatible technology
- Infrastructure installation costs comparable to set up a WiFi communications network
- Value creation complements other indoor positioning technologies
  - In areas where less accurate positioning is enough, e.g. WiFi positioning can be used
  - For consumers, seamless transition from one positioning technology to another can be built

→ Enables mass markets both for B2B and B2C applications

→ Value creation for venue owners justifies deployment and operational costs

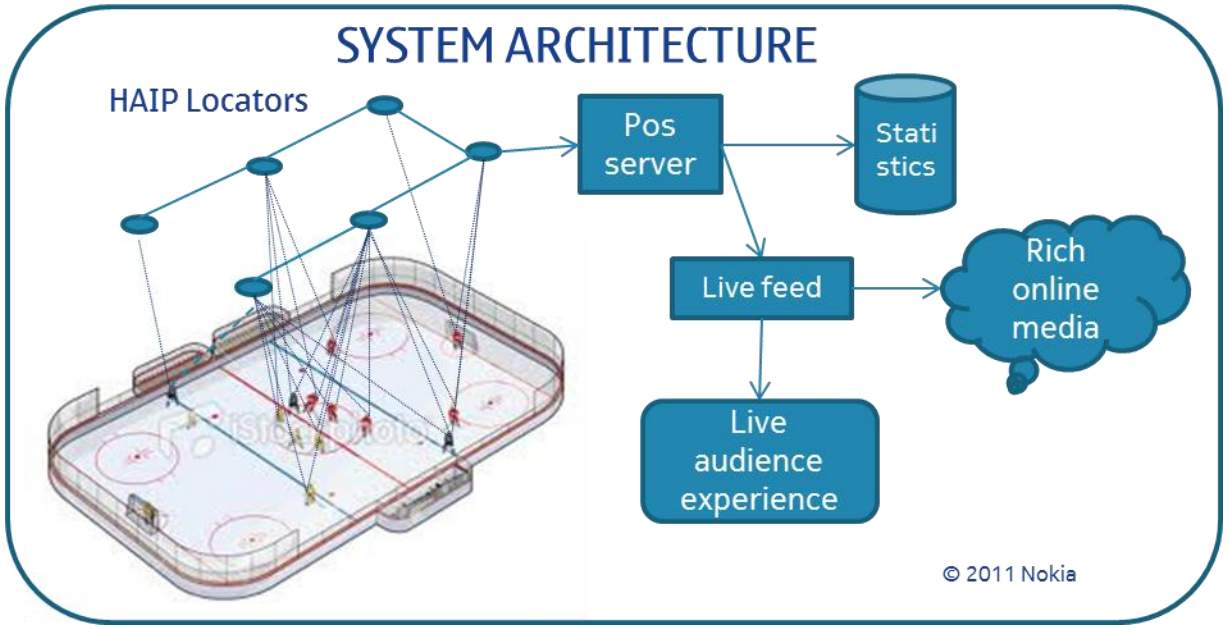
Use Case Examples

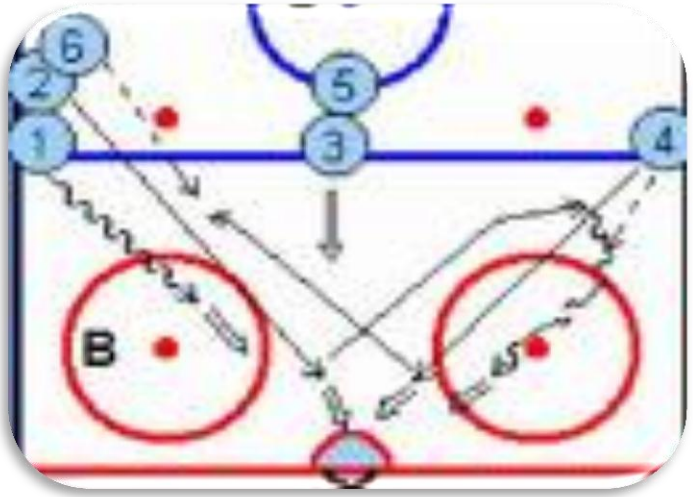
Use Case Example: Sports

Real-time player and puck/ball tracking

- Player movement patterns
- Automatic pass charts and shot counts
- Player & team performance statistics
- Live player location feed for online media
- Event playback for live audience

With up to 20Hz tracking and 1 foot accuracy





Use Case Example: Retail

Real-time anonymous shopper path tracking

- Based on tags mounted on shopping carts and baskets
- Statistical analysis of average routes
- Identification of bottlenecks and hotspots
- Layout optimization and valuation of shelf locations

The locator network provides a future platform for mobile location based services!

Use Case Example: Indoor Navigation

Retail: malls, supermarkets

- **Find** a shop and a product
- **Track** your children
- **Get** special offerings, coupons, and real time information of services

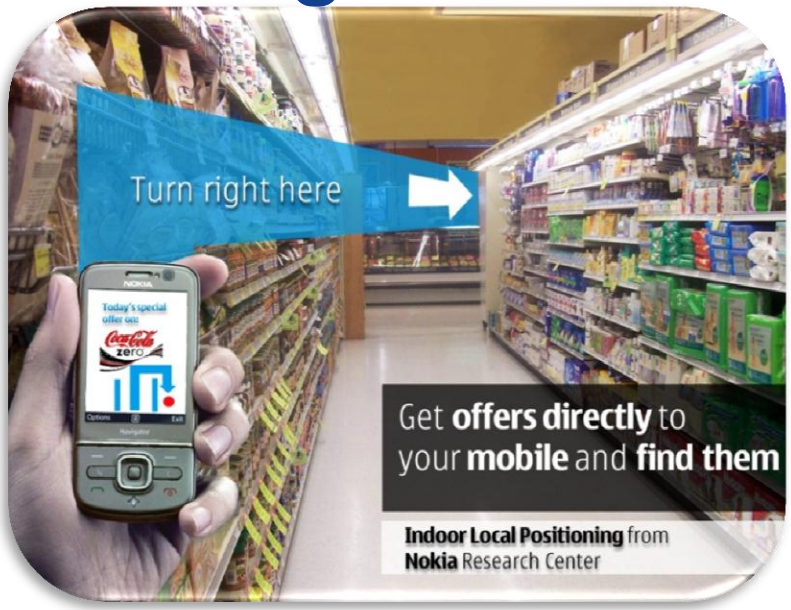
Airports, train stations

- **Find** your gate/platform, get notification of changes, get real time information of lines
- **Navigate** turn-by-turn to your plane/train or even seat
- **Track** your luggage

Sports arenas, concert halls, museums, fair centers, amusement parks, cruise ships, etc.

- **Find** your seat, shortest snack line, your friends
- **Get** information of what's around you
- **Navigate** to any point of interest
- **Find** your car in the parking garage

HAIP enables an automatic WiFi fingerprint collection platform to serve other smart phones



Live Demos

- HAIP -
High Accuracy Indoor Positioning

Ice Hockey Rink
Barona Arena
Espoo, Finland

Basketball player tracking

Topo vs. Kauhajoen Karhu, Helsinki, March 10, 2012