



Next Generation Indoor Location for Public Safety

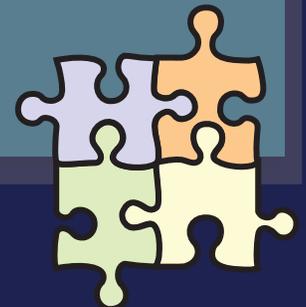
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Indoor Location – Leveraging “Baked-In” Technologies

- Improved GPS technology
 - Universal, but incremental, improvement for indoor 9-1-1
- Residential Wi-Fi
 - Important for calling 9-1-1 from “where we live”
- Enterprise Wi-Fi
 - Important for calling 9-1-1 from “where we work”
 - Important for calling 9-1-1 from “where we learn”
 - Important for calling 9-1-1 from “where we play”

Today’s discussion



Where's the 9-1-1 caller?

The screenshot displays the TCS GEM911 web interface. At the top, there are browser tabs for 'GEM911 - Geo-spatial Em...' and a status bar indicating 'You are sharing your desktop'. The main header includes the TCS GEM911 logo, a 'Help' link, and a 'Sign Out (Lance Pitt)' button.

The interface is divided into several sections:

- Message Transcript:** Shows a message from 1-206-321-7809 with the subject 'Testing outdoor 911 location'. A green response bubble contains the text: '✓ You have reached 911. Where is the emergency?'.
- My Active Sessions:** Lists the current session with phone number 1-206-321-7809 and user Lance Pitt.
- Other Active Sessions:** Lists other sessions for Rod Robinson with phone numbers 1-425-877-4300 and 1-206-518-0767.
- Response Form:** A dropdown menu shows the selected response 'You have reached 911. Where is the emergency?'. Below it is a text input field labeled 'Enter text to be sent.' and buttons for 'Send Message' and 'Clear'.
- Map:** A 3D map of a city area with streets labeled 'Indiana Ave NW', 'C St NW', and 'Pennsylvania Ave NW'. Two red location markers are visible on the map.
- Location Data:** A box on the right side of the map displays the following information:
 - Located At: Sep 18 7:44:10 PDT
 - Latitude: +38.89417
 - Longitude: -77.02028
 - Hor Uncertainty: 148
 - Position Source: 135
 - Status: ✓ Location Found
- Refresh Location:** A button located below the location data box.

The Windows taskbar at the bottom shows various application icons and the system clock indicating 1:13 PM on 9/18/2014.

CSRIC III Testing – Results of outdoor testing – X, Y accuracy

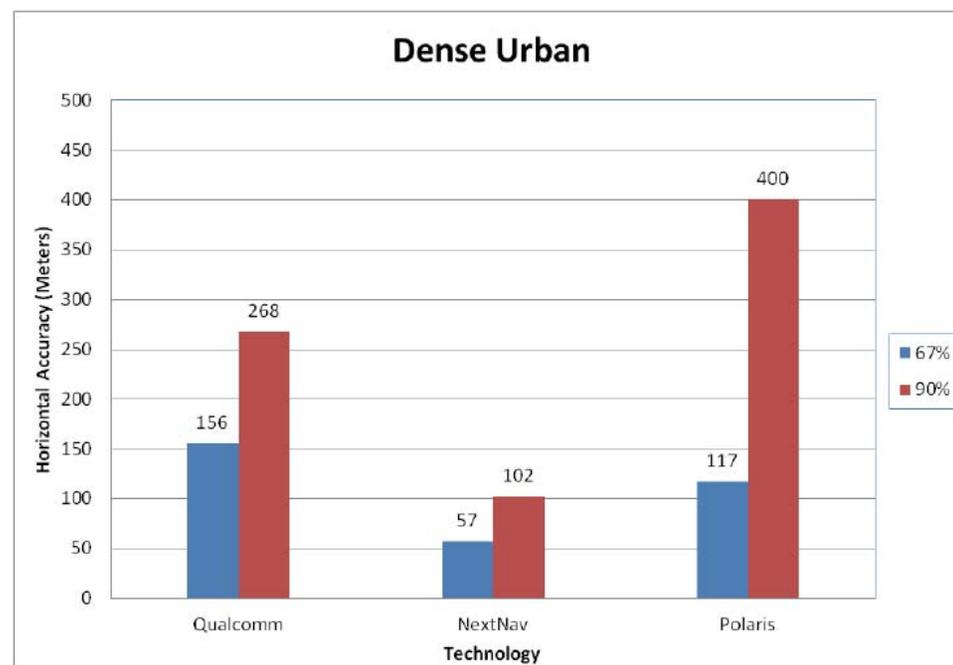


Figure 7.3-2 Accuracy Percentiles in the Dense Urban Environment

A “dispatch-able” location?

- Current and tested technologies deliver an X, Y, Z coordinate
 - Requires reverse geocoding for dispatch
 - How does the Z coordinate equate to a floor number?
- X, Y, Z is good for outdoors, but not indoors
- Cisco office at:
 - 601 Pennsylvania Avenue, N.W. North Building
 - Suite 900
 - Washington, District of Columbia, 20004
- Public Safety would get:
 - 38 53.599' N 77 01.216' W
 - Elevation 149'



**Elevation = 149 feet
What does that mean???**

Alternative Approach: Enterprise Wi-Fi

Enterprise Wi-Fi becoming ubiquitous

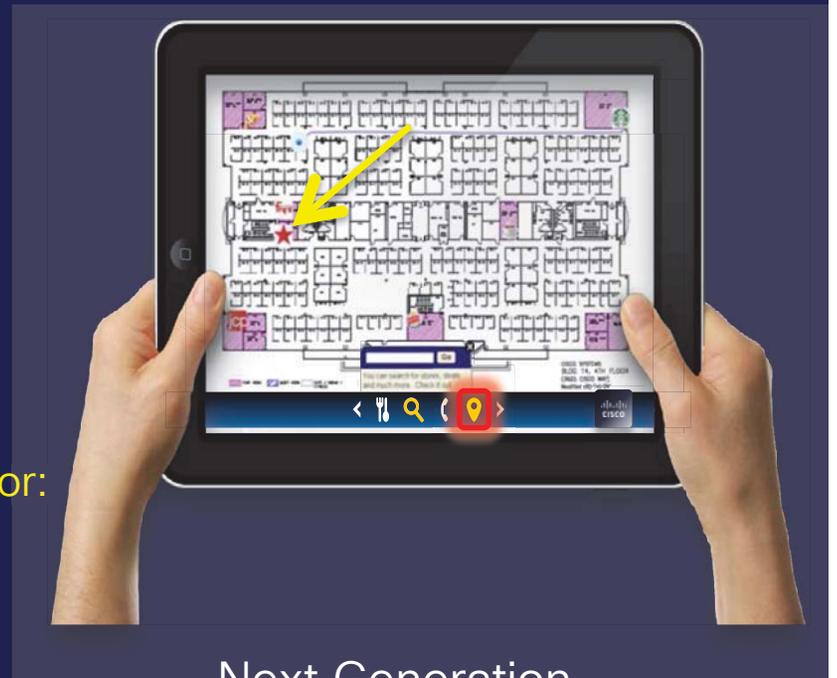
- 60% of cellphones now smartphones w/WLAN interfaces
- Up from 40% just a couple of years ago
- Device location is built-in (802.11)

Growing subset of Enterprises use Device location for:

- Asset Tracking
- Customer Habit Awareness
- Facilities Planning

Location technology can be accessed by Public Safety

- “Dispatch-able” Location
- Initially: Civic address & floor number (for legacy)
- Next Gen: Floor plans and real-time data

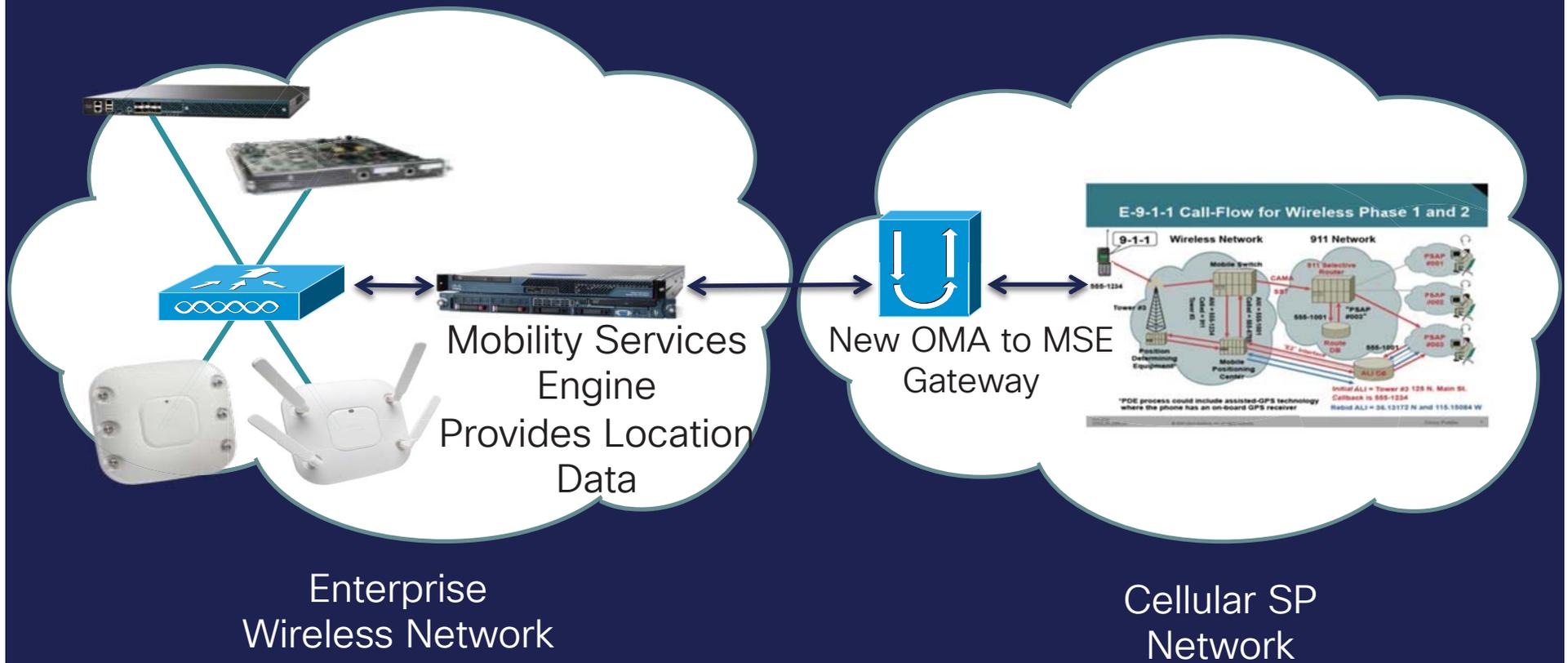


Next Generation

802.11 location – “Connect the Dots”

- We just need to connect the existing Enterprise Wi-Fi to the cellular location infrastructure
 - Needs to be done **securely**
 - We know how to do that!
 - Enterprises need assurance this is **only for emergency calling**
 - We know how to do that!
 - PS need assurance 802.11 location is **trustworthy and accurate**
 - Enterprises deploying LA networks do so for their own benefit
 - Enterprises manage and maintain their location infrastructure as it's \$\$ to them.
- **No new hardware – uses existing devices and infrastructure**

Enterprise Owned/Operated Location Aware Infrastructure



How Location Is Calculated?



This Merits a Collaborative Approach

- Need to bring together ‘all’ the players
 - Cellular Service Providers
 - System Service Providers
 - Enterprises
 - Wi-Fi Equipment Providers
 - Smartphone Vendors
 - Public Safety
 - Government



Thank you.

