

Bring Location Awareness to Mobile Devices using Wi-Fi with Deviceescape SoftGPS

Welcome to our Webinar!

Dennis Bland

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Audio Recommendations

- Two Ways to Receive Your Audio
 - Audio headphones to your Mac / PC (can be choppy)
 - - OR -
 - Telephone Access for a Dial In Number (preferred)

Getting Technical Help

- During a webinar, you can get help by using the “ask a question” box or email us at
- j.mcdonald@eg3.com
- We will be monitoring that email during the session for “technical” questions, only.

- All phones will be on mute
- Questions can be asked at any time via text during the presentation
- Questions will be answered at the end of the presentation



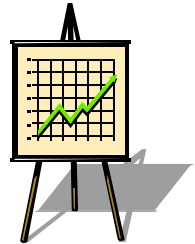
- Dennis Bland, Field Engineering Manager
- Dennis Bland has more than 10 years of experience in the development of embedded systems and Wi-Fi solutions. Dennis is currently responsible for Field Engineering Management at Devicescape. In this role, Dennis helps customers all over the world utilize Devicescape technology to build innovative products.
- Dennis has participated in the IEEE working groups for 802.11e and 802.11i standards development and the Wi-Fi Alliance working group for the WPS specification, and he also has a background in wireless antenna and hardware design. Prior to working with Devicescape, Dennis was with Wind River Systems (now Intel), the leading provider of embedded systems.

- Location and Mobile Device Trends
- How to Make Devices Location Aware
- Challenges for Location-aware Wi-Fi Device Makers
- Using Wi-Fi to Determine Location
- Devicescape's Solution: *SoftGPS*
- SoftGPS Coverage
- Where to get SoftGPS
- Questions?



1. Location-based services is a top mobile trend

- Explosive growth of applications and services such as Foursquare, Gowalla, Yelp, Urbanspoon, Twitter, Facebook...
- Geolocation support in HTML5 is fueling additional growth in browser-based applications
- Location-aware functionality becoming an expected feature



2. Wi-Fi is a de-facto feature on mobile devices

- 770 million Wi-Fi chipsets will ship in 2010, up 33% from '09*
- Over half of the volume is for mobile handsets and laptops

Device makers must capitalize on these trends!

*ABI Research, May 28, 2010

How to Make Devices Location Aware?

- **GPS**
 - Requires a GPS chipset
 - Accurate when it works, but can be slow
 - Does not work in most indoor locations
- **Cellular (cell tower triangulation)**
 - Requires a cellular chipset
 - Requires an active cellular account and HLR access
 - Limited accuracy
- **Assisted GPS (A-GPS)**
 - Requires both GPS and cellular chipsets
 - Better coverage than GPS
- **Wi-Fi**
 - Requires a Wi-Fi chipset (already in many devices)
 - Venue-level accuracy or better



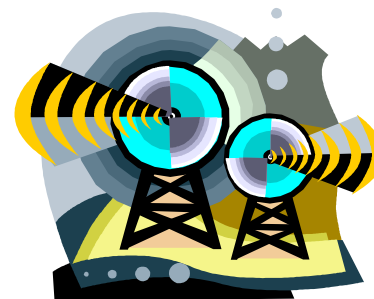
Challenges for Device Makers

- **Impact on BOM Costs**
 - Cellular and GPS chipsets are not practical for cost-sensitive consumer electronics such as digital cameras and game players
- **Power Consumption**
 - Cellular and GPS chipsets consume more power in active mode than Wi-Fi
- **Indoor Performance**
 - Mobile devices are often used indoors (coffee shops, restaurants)
 - GPS does not work and A-GPS may not be accurate enough
- **End User Costs**
 - Cellular connectivity requires ongoing network access fees
- **Different Applications Require Different Location Accuracy**
 - Many location-based services do not need high accuracy
 - Some need location context instead of simple position



Using Wi-Fi to Determine Location

- Available on any Wi-Fi device
 - Location can be “retro-fitted” into existing devices through application and firmware upgrades
- Location is usually obtained within a few seconds
- Accuracy is a typical Access Point coverage area (~100m) or better



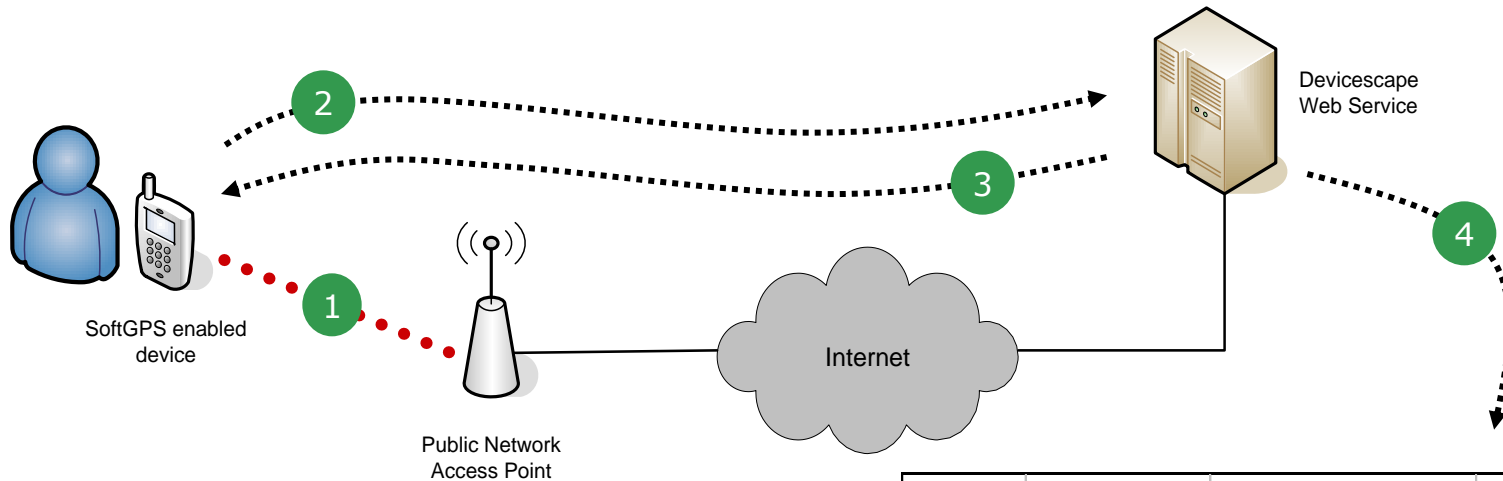
Introducing Devicescape *SoftGPS*

- Software-based location service using Wi-Fi
- No need for GPS or cellular hardware
 - Can compliment GPS to improve indoor coverage
 - Can compliment A-GPS
- Low BOM and operating costs
- Good accuracy, practical coverage
 - Wi-Fi granularity (~100m)
 - Server-side processing for improved accuracy
 - Coverage available where Wi-Fi is and where people go
- Enables new applications
 - “Where am I now?” determined in seconds
 - “Where have I been?”



- **Dynamic lookup**
 - SoftGPS is used to retrieve the current location “on demand”
 - Works over WiFi or any other type of network connection
 - Example: Geo-fencing for company assets
- **Deferred lookup**
 - SoftGPS stores WiFi environment; lookup is performed later
 - Lookup can be performed by another application (on PC or server)
 - Example: location-stamping pictures for a digital camera
- **Embedded lookup**
 - SoftGPS is embedded on device for standalone use without connection
 - Approx 20MB per million points, uncompressed
 - Example: inner-city delivery vehicle

SoftGPS: Dynamic Lookup



Device	Network	Location	Time
abc123	00:12:34:56:78	51°4'60 N, 114°4'60 W	4/25/2010 15:45

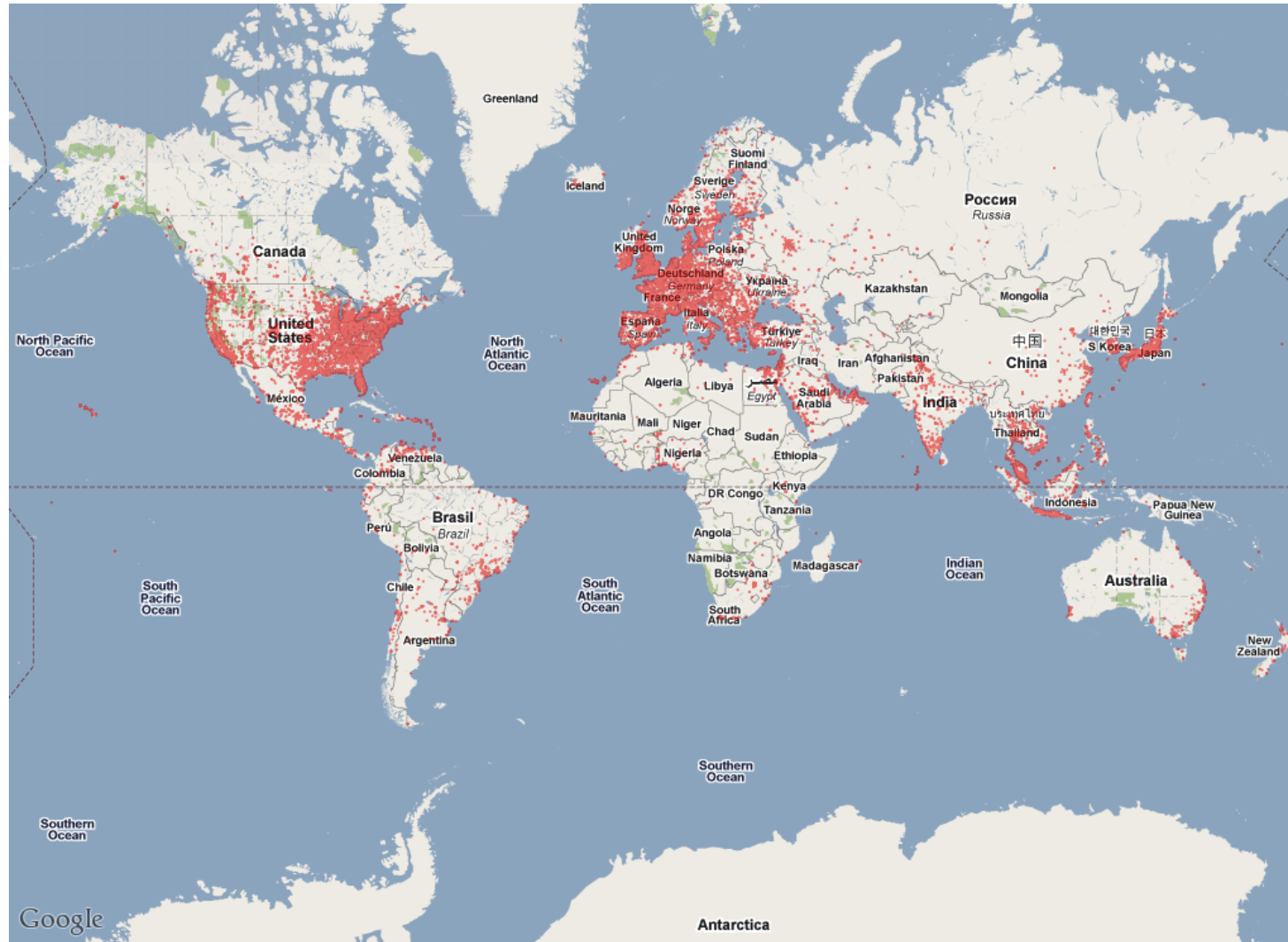
- 1. A Device with SoftGPS associates to an Access Point.**
- 2. The device sends a message containing Access Point information to the Devicescape Web Service.**
- 3. The Devicescape Web Service responds with geo-location information for the Access Point.**
- 4. Device location and history can be accessed via Web Service APIs.**

SoftGPS: Client Requirements

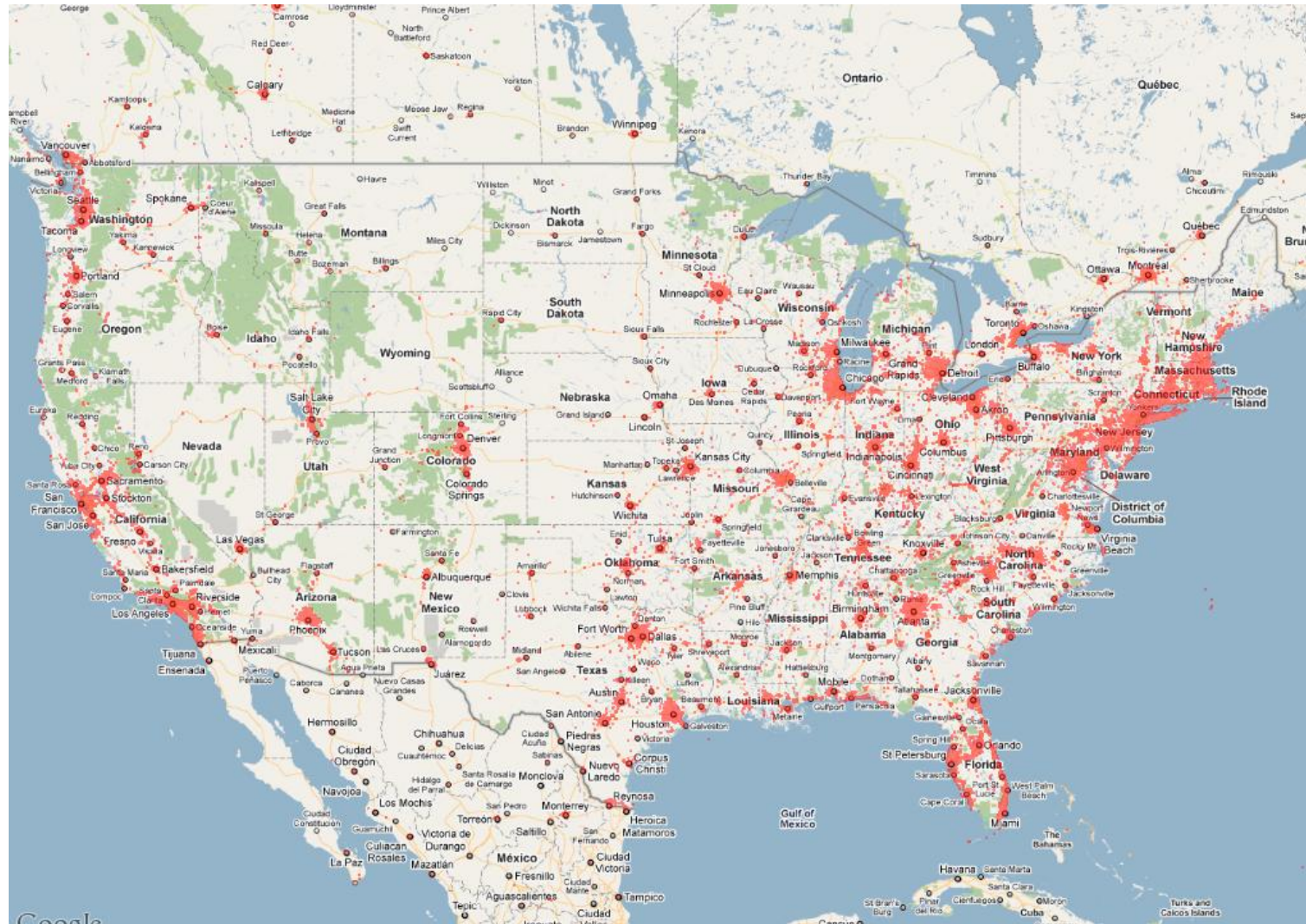
- Uses existing Wi-Fi hardware and software resources on the device
- The application only needs to send a simple location request to the SoftGPS service and receive the response
- The latitude/longitude information can then be used by the application to derive physical address or venue information



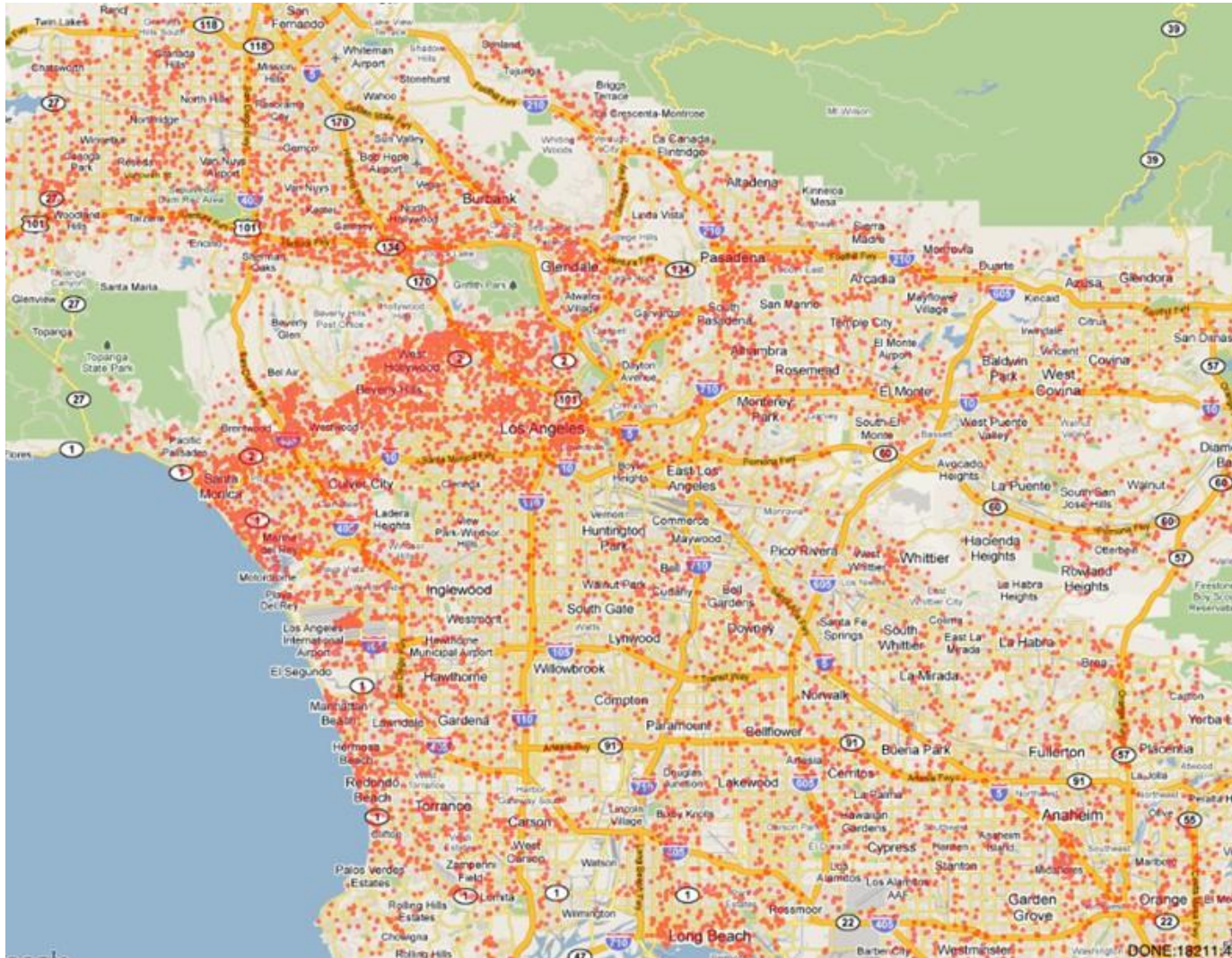
SoftGPS Coverage: World



SoftGPS Coverage: Continent



SoftGPS Coverage: Region



SoftGPS Coverage: City

- Google Earth view of street Coverage

- SoftGPS is available now from Devicescape
- Resources at www.devicescape.com/softgps
 - Overview and technical documentation
 - Windows application for evaluation (Windows 7 / Vista)
 - Windows 7 sensor / location driver
 - Maps and Google Earth coverage examples
- Early Adopter Program – **FREE SERVICE!!!**
 - Licensees who sign up during the next 6 months will receive basic SoftGPS service free of charge
 - Contact dsbizdev@devicescape.com for details

Questions?



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