Indoor Signal Position Conveyance
draft-jones-geopriv-sigpos-survey

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geopriv WG

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Outline

- Problem domain
- Why geopriv
- Current standards activities
- Current industry activities
- sigpos draft
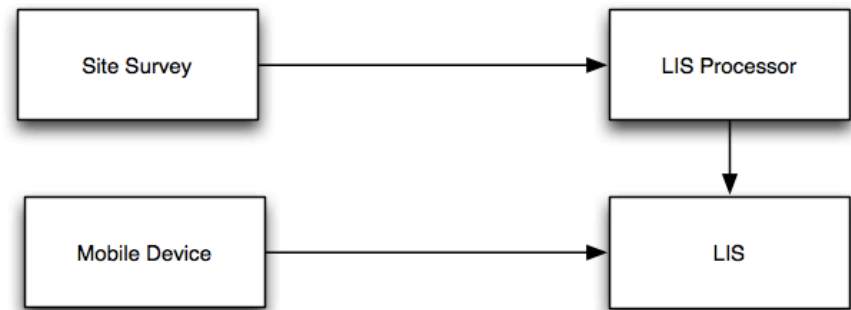- Open issues
- Next steps

Goals

- Provide a means to capture and convey signal survey information from a survey device to a LIS processor.
- Provide data rights facility for managing data usage
- Provide flexible structure to support multiple models of location services, e.g. rss-based and fingerprint-based location services
- Provide ability to capture information from heterogeneous signal sources, e.g. WiFi or Bluetooth Low Energy beacons
- Provide common specification for interoperability
- Provide mechanism to link signal survey data with map survey data

Who benefits?

- Venue Owners
  - Improve participation by:
    - reducing vendor lock-in
    - increasing confidence in industry solutions
    - ability to manage data rights
    - ability to offer differentiated location services
- Service Providers
  - Increase competitive landscape
  - Reduce redundant work
  - Lower cost of data acquisition by leveraging venue owners and customers
- Tool Providers
  - Ability to produce tools that work with multiple vendors
- Consumers
  - Integrated location and map capabilities with context

Problem Domain

BASIC INDOOR PROVISIONING SCENARIO

Need a common way to convey information about the location of signals and their respective beacons for use in indoor location provisioning.

Today's methods use proprietary systems that lack interoperability, consistency, and data protection mechanisms.

This does NOT address how the signal information is captured (e.g. survey equipment) nor how the data is used to operate a LIS.

Similar to HELD Measurements, but intended to identify the location of the beacons and their signals rather than the device that is observing the signals.

Problem Domain - Signal capture

- **Indoor site survey, e.g.**
- **Where are the beacons and what is the signal map?**
  - Need baseline understanding of signals and beacons
  - Many different signal sources
  - Many different data requirements
  - Need knowledge of survey device capabilities
  - Need knowledge of survey device's location and orientation
  - Provide common conveyance for signal survey data
- **Why real-time?**
  - Need continuous site survey to refresh system
  - Ability to use partial surveys, e.g. multiple sources
  - Ability to use crowdsourced data

Problem Domain - Data rights

- **Why data rights?**
  - Provide a mechanism that can specify usage, retention, and derivative rights to the data
  - Encourages participation by venue owners
  - Provides ability to offer differentiated services
  - Promotes interoperability and transportability of the data
- **Proposed data licenses**
  - Unrestricted
  - One of pre-defined Creative Commons license
  - Private
  - Expiration
  - No enforcement mechanism
- **What are derivative rights?**
  - Using data to derive location of other beacons
  - Ability to bootstrap and replace data
  -

Why geopriv

The GEOPRIV working group is chartered to continue to develop and
   refine representations of location in Internet protocols, and to
   analyze the authorization, integrity, and privacy requirements that
   must be met when these representations of location are created,
   stored, and used. The group will create and refine mechanisms for the
   transmission of these representations that address the requirements
   that have been identified.

- Location based specification with data privacy requirements
- Similar to HELD
- Leverage many geopriv specifications
- Clear industry need
- Numerous interested parties and nascent alliances
- Existing sigpos draft to work from

Current Standards Activities

- **OMA**
  - SUPL 1.0 and 2.0
  - SUPL 3.0 and LPPE 1.0 recently published (w/ indoor related reqs)
- **IEEE**
  - 802.11v - location info in WLAN layer
  - 802.11u - enables service discovery
- **IETF**
  - geopriv - civic, held, relative, PIDF-LO, etc.
- **W3C**
  - geo-location API, POI, device orientation
- **OGC**
  - Indoor GML SWG
- **Others: FCC, Small Cell Forum, 3GPP/3GPP2, BTSIG**
- **HT - Kirk Burroughs, Qualcomm**

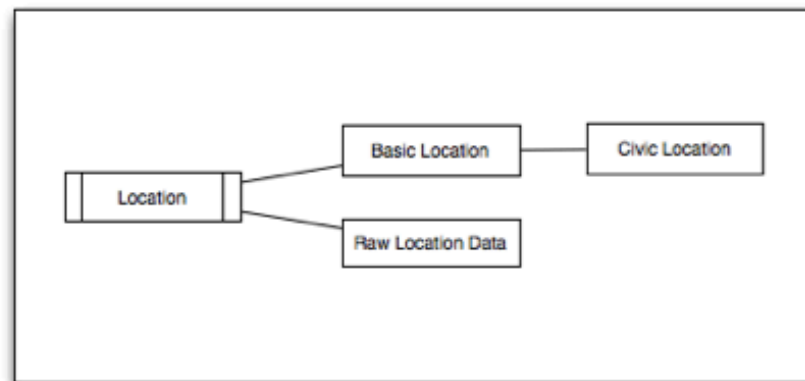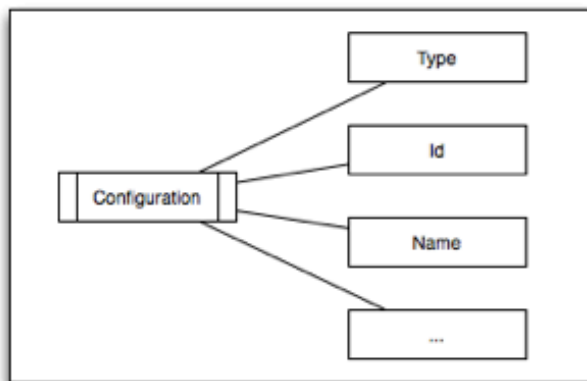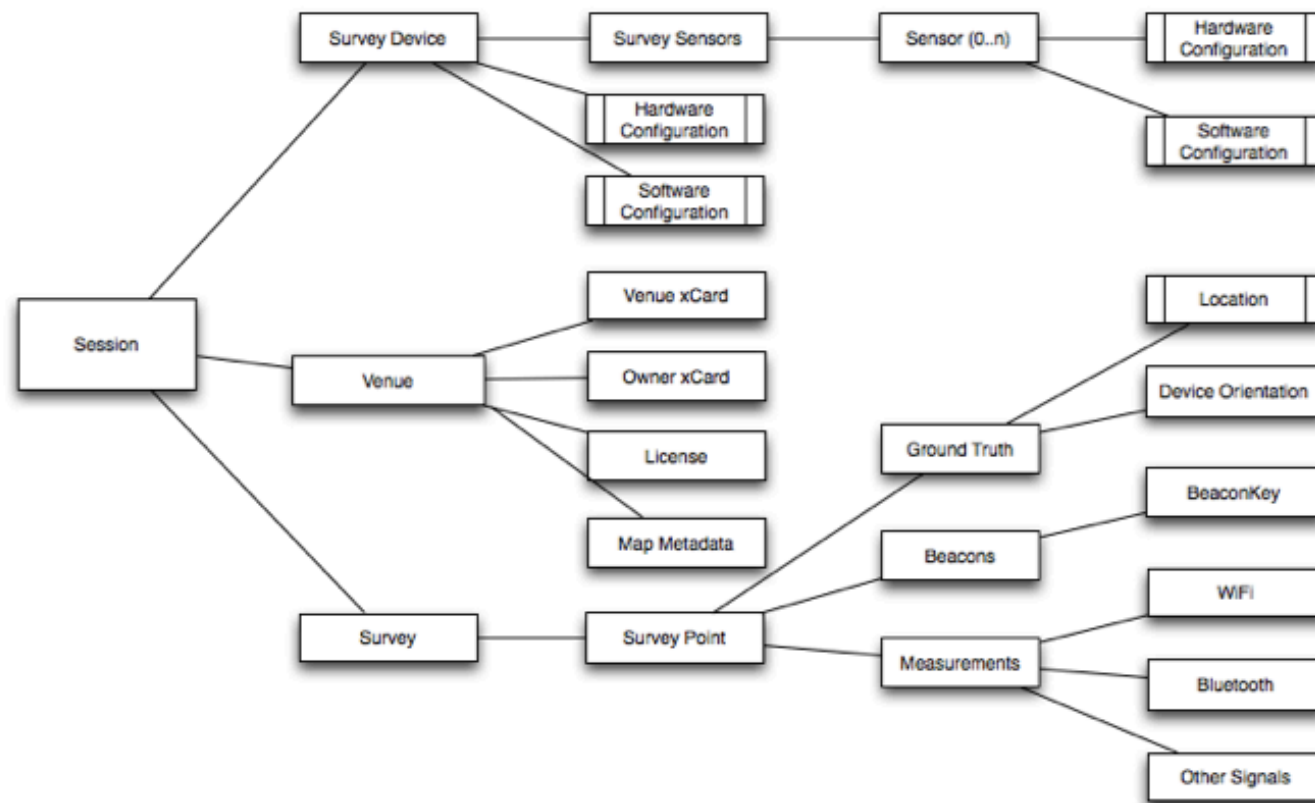# Current Industry Activities

- **In-location Alliance**
  - Qualcomm supported
    - A new industry alliance aimed at accelerating the market adoption of indoor location technologies and services. Members of the In-Location Alliance is open to any company with an interest in indoor location. Initial members include 22 companies representing chipset vendors, mobile network operators, handset manufacturers, application developers, and system integrators. The Alliance will promote standardization of key interfaces and encourage its members to collaborate in trials of new technologies and services.

- **Accurate Mobile Indoor Positioning Special Interest Group**
  - Nokia supported
  - Define one or more specification(s) that describe protocols and functions for indoor positioning solutions enabling their utilization in conjunction with indoor maps, digital guidance, navigation, and related services; and
  - The SIG will focus on solutions, that fulfill key commercial and technical requirements; such as high accuracy, low power consumption and mobility; and
  - The primary solutions to be considered will be based on directional Bluetooth low-energy and Wi-Fi standards.

sigpos draft outline

sigpos draft - outline

- Session
  - Venue
    - Venue name/address
    - Venue owner
    - Data Rights
    - Map metadata
  - Survey Device
  - Survey
    - Ground Truth
    - Beacons
    - Signals

sigpos draft - data licenses

- Unrestricted License - allows unrestricted use and derivative rights to the data.
- Creative Commons License
    - Leverages existing work, templates, and definitions
    - Not all CC licenses are valid for this specification
- Private License
    - Allow externally defined license types

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  <licenseExpiry>2008-04-29T14:33:58</licenseExpiry>
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sigpos draft outline - specifications incorporated

- Venue/Owner information - xCard RFC 6351
- Measurements - geopriv-held-measurements
- Civic Address - geopriv-local-civic & RFC 5139
- Relative locations - geopriv-relative-location
- PIDF-LO - RFC 4119, RFC 5774, RFC 5962
- Creative Commons
- GeoShape/OGC-GML
- NMEA0183

sigpos draft - profiles

- Profiles - reduced set of capabilities to provide example implementations

  - Beacon Location Profile
    - Only want to know precise location of beacons
    - Can be used for rss based location

  - WiFi Fingerprint Profile
    - Create signal map of venue
    - Can be used for fingerprint based location

Known Issues

- Additional privacy considerations
- Device configuration method
- Licensing options

Next Steps

- Incorporate feedback from geopriv WG
- WG accepts ID as official WG doc
- Entice more industry involvement
- Work document through to adoption

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