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Greeting and Introduction Geosemantic Summit

73rd OGC Technical Committee
Silver Springs, Maryland, USA

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Motivation



- Federation of disparate geospatial services and data across domain and community boundaries:
 - Increasing need to perform semantic mediation between the concepts and vocabularies brought into these federations in order for discovery and exploitation of geodata resources to be successful.
 - Need for a consistent geosemantic framework for successful mediation to occur.
- Publication of linked geodata.
 - “Putting it out there and see what happens” has enormous potential for geospatial enablement and fusion.
 - Also has enormous potential for confusion and duplication as link scheme development and "triplification" are carried out in many different ways.

Agenda



- Greeting and Introduction
 - Josh Lieberman: Motivations, issues, opportunities
- Semantic Mediation Case
 - Dave Kolas, Philippe Duchesne, Michael Piasecki, Luis Bermudez
- Linked Geodata Case
 - Carsten Roensdorf, Todd Pehle, Xavier Lopez
- Breakout Groups
 - Ontologizing data
 - Ontologizing services
 - Cross-domain discovery
 - Feature link modeling
- Reports and Actions
 - Reference model for semantic enablement
 - Specific semantic profiles of OGC specifications

Summit Goal



- Examine semantic mediation, linked geodata, and other trends in the application of geosemantics
- Initiate development of a reference model for the use and adaptation of OGC standards to further enable critical geosemantic applications.

History (abbreviated)

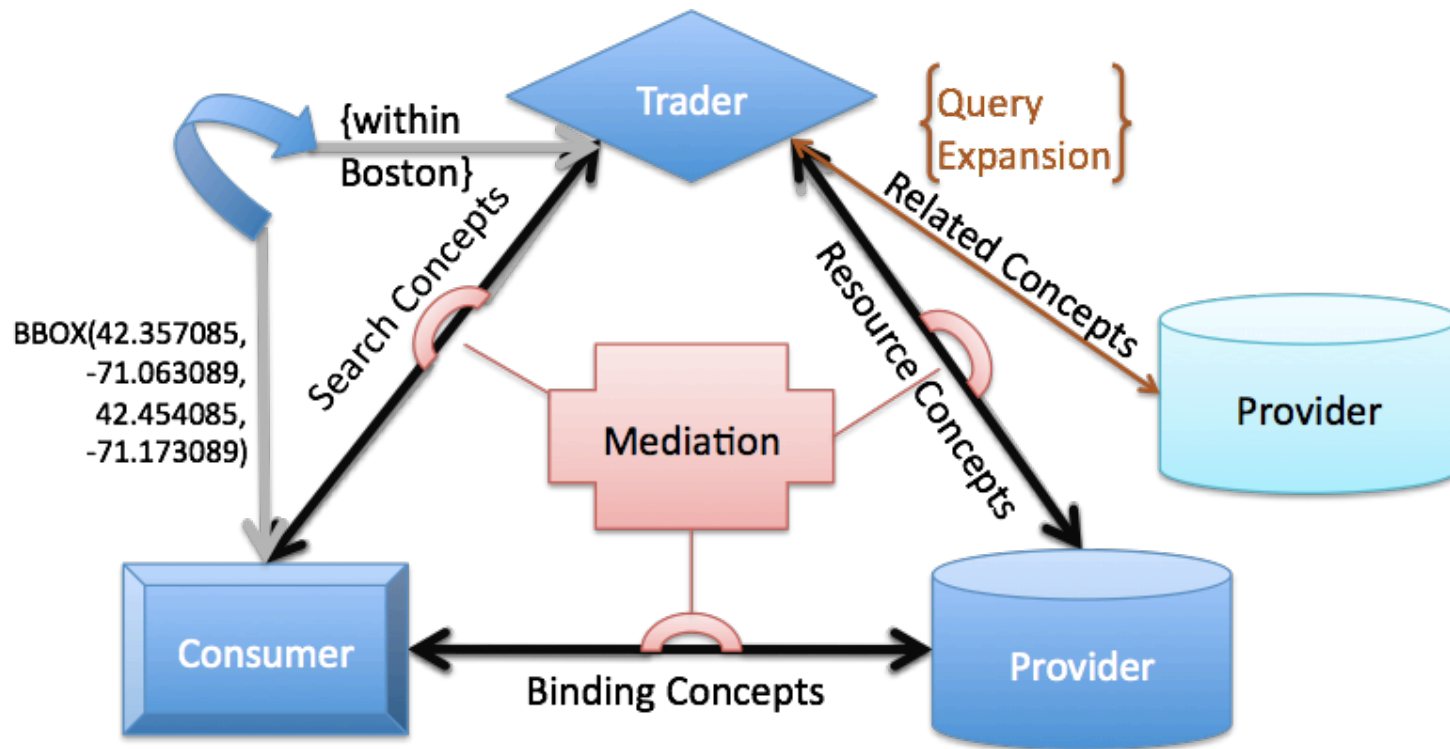


- 1999 Semantics SIG, Ontologies and GIS
- 1999 OGC Abstract Topic 14 – Semantics and Information Communities
- 2003 W3C Geo vocabulary
- 2006 OGC Geospatial Semantic Web Interoperability Experiment
- 2006 W3C Geo vocabulary updated from GeoRSS
- 2006 OGC Geosemantics Domain Working Group
- 2007 Spatial Ontology Community of Interest
- 2008 Marine Metadata Initiative mediation services
- 2009 Linked geodata (UK and elsewhere)
- 2010 Geospatial SPARQL RFC
- 2010 Semantic mediation in GEOSS AIP-3
- 2010 Many other activities

Service Oriented Architecture and Mediation

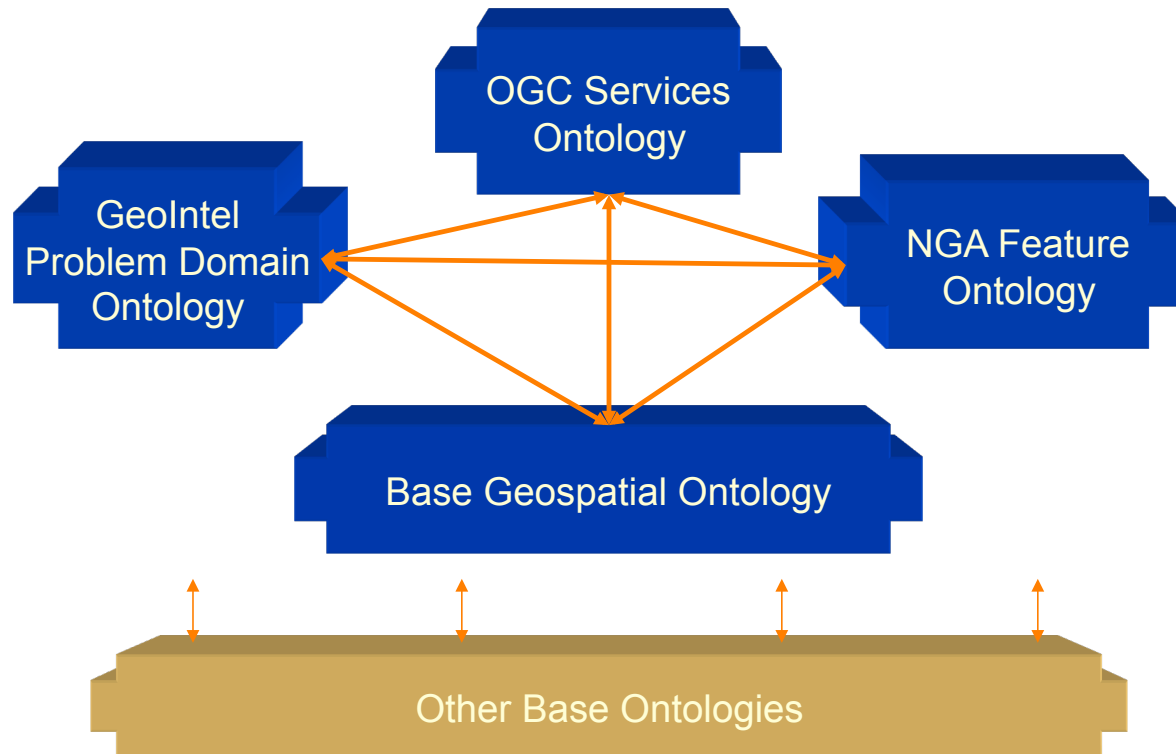


Distinct functionality offered through shared interoperability arrangements





Multiple GSW Ontology Components

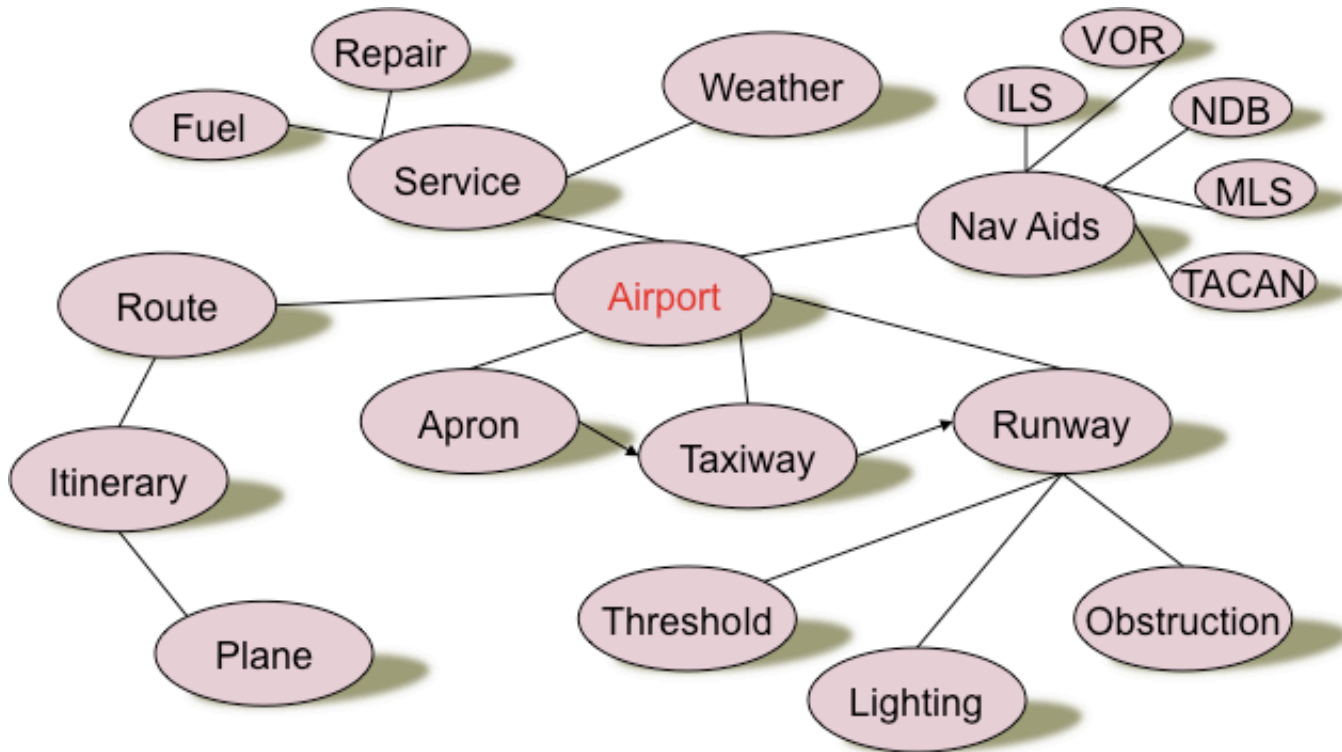


Geosemantic Mediation Issues



- Formal concepts
- Mapping between concepts: theory and representation
- Semantic heterogeneity
- Application of concepts
- Utilization of mappings
 - Query Expansion
 - Result translation

Linked Geodata



Linked Geodata Issues



- “Triplification” -> variety versus excessive “Same-as”
 - Level of detail -> “Same-as” at one level and “Different-from” at another
- General Feature Model -> General Triple Model?
- Web-accessibility of names and links
- The spatial problem (non-orthogonal):
 - Type links “Type-of”
 - Schema links “Property-of”
 - Instance links “Same-as”
 - Spatial links “Same-place-as”
 - Topological links “Is-connected-to”
 - Mereological links “Is-part-of”
 - Cognitive links “represents-same-chunk-of-reality”
- Computability / decidability -> does it matter?

Reference Model – Views & Definitions



- Conceptual / abstract description
- Pattern or framework for specifications
- Provides standards for implementation
- Educational – guidelines, practices, motivations
- Basis for discussion and collaboration
- Call to (specification) action
- Differentiation – what needs to be different about a geospatial and / or semantic specification
- Examples:
 - OGC Reference Model (!)
 - RM-ODP
 - FEA Data Reference Model

Activities – Today and in the Future



- Breakout Discussions
 - Ontologizing data
 - Ontologizing services
 - Cross-domain discovery
 - Feature link modeling
- Report and Actions
 - Reference model for semantic enablement
 - Feature linking
 - Geospatial concept mapping
 - Standard ontologies
 - Semantically enabled service
 - Specific semantic profiles of OGC specifications
 - Simple Linked Features
 - Geospatial SPARQL
 - Semantic WFS
 - Geosemantic Broker Service

Semantic Mediation



- Semantic enablement - Dave Kolas
- Semantic annotation - Philippe Duchesne
- CUAHSI ontology and semantic heterogeneity - Michael Piasecki
- Semantic mapping - Luis Bermudez

Linked Geodata



- Ordnance Survey linked geodata - John Goodwin / Carsten Roensdorf
- SOCoP demonstration and USGS TNM linked data ideas - Todd Pehle
- Linked data query and GeoSPARQL RFC - Xavier Lopez