

Semantics in EarthCube

Nancy Wiegand

*Space Science and Engineering
University of Wisconsin - Madison*

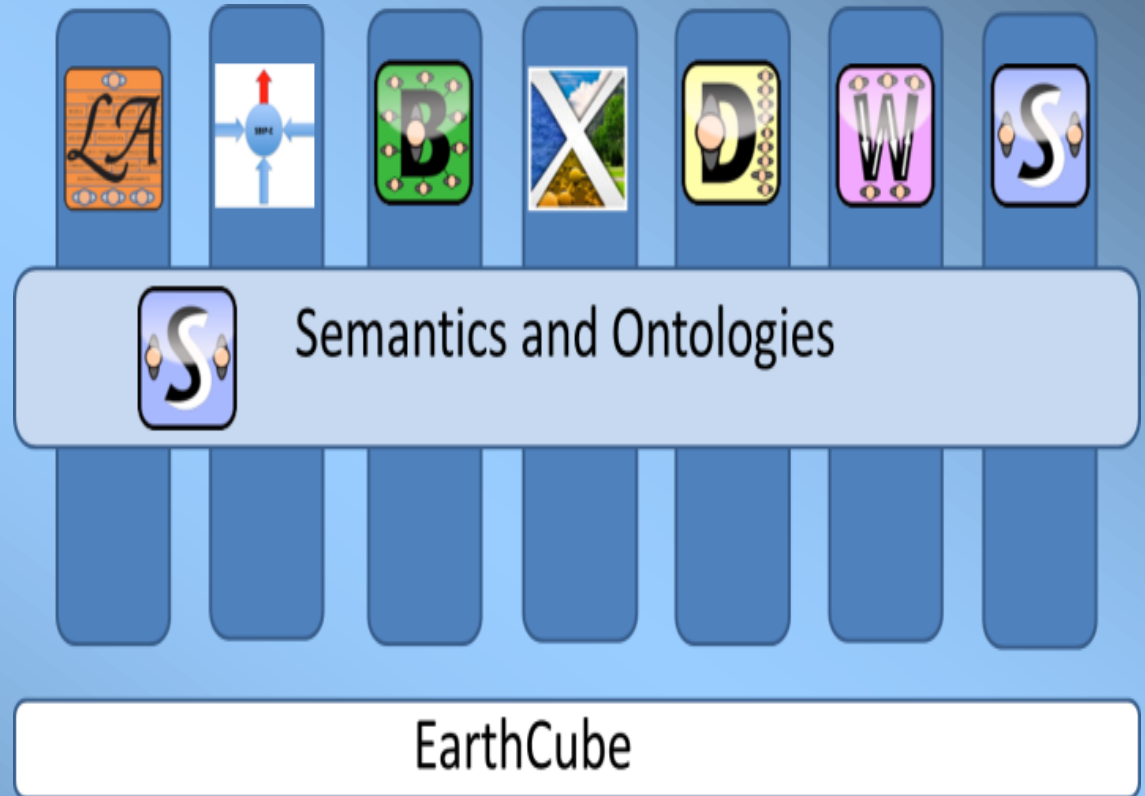
Transition

- These slides transition between:
- Krishna Sinha's Building Blocks talk and
- Leo Obrst's Ontology tutorial, and
- Dave Kolas's tutorial on GeoSPARQL



EarthCube Communities

Left to right:
Layered Architecture
Web Services Concept
Brokering
Interoperability
Data mining
Workflow
Semantics





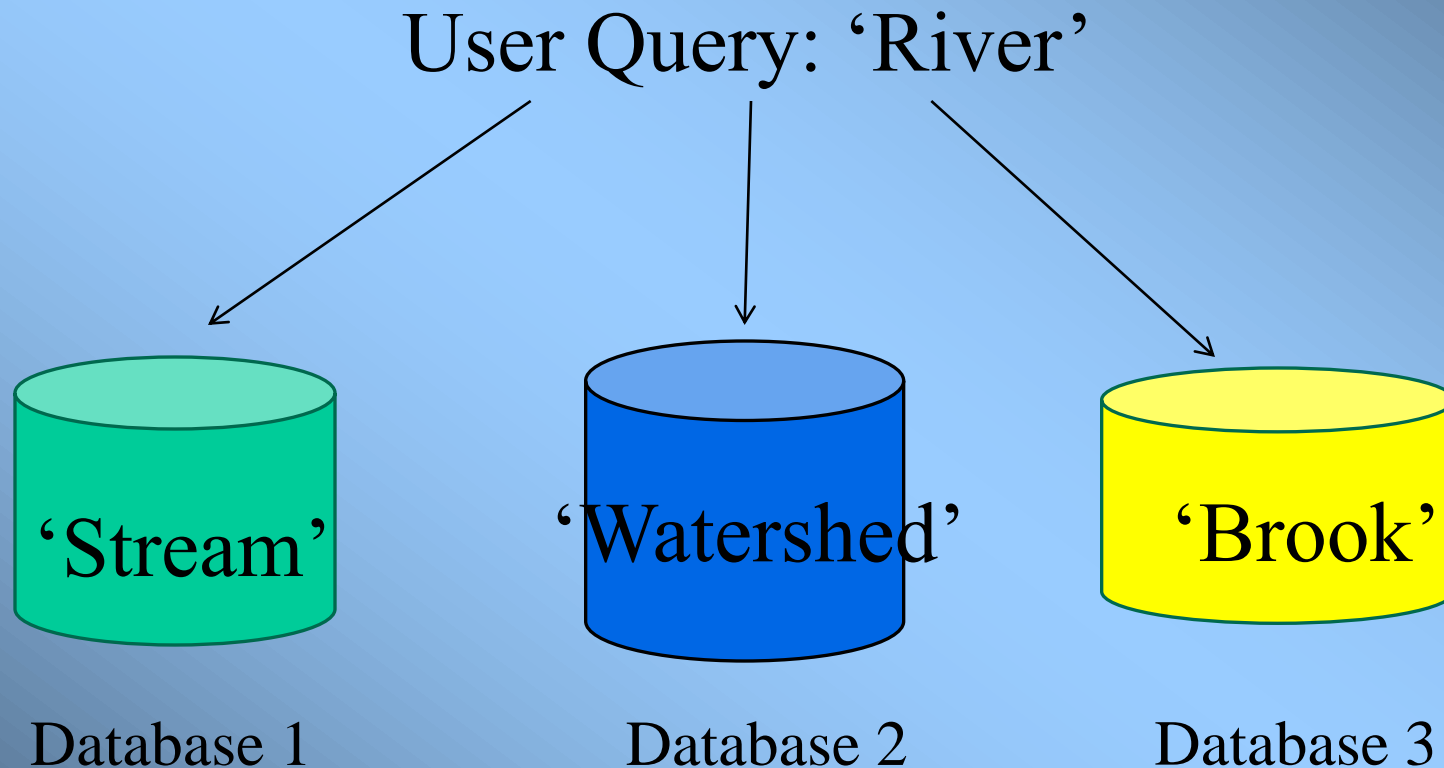
EarthCube Semantics and Ontology Community Group

Group Description: Semantics and ontologies cover a number of research areas:

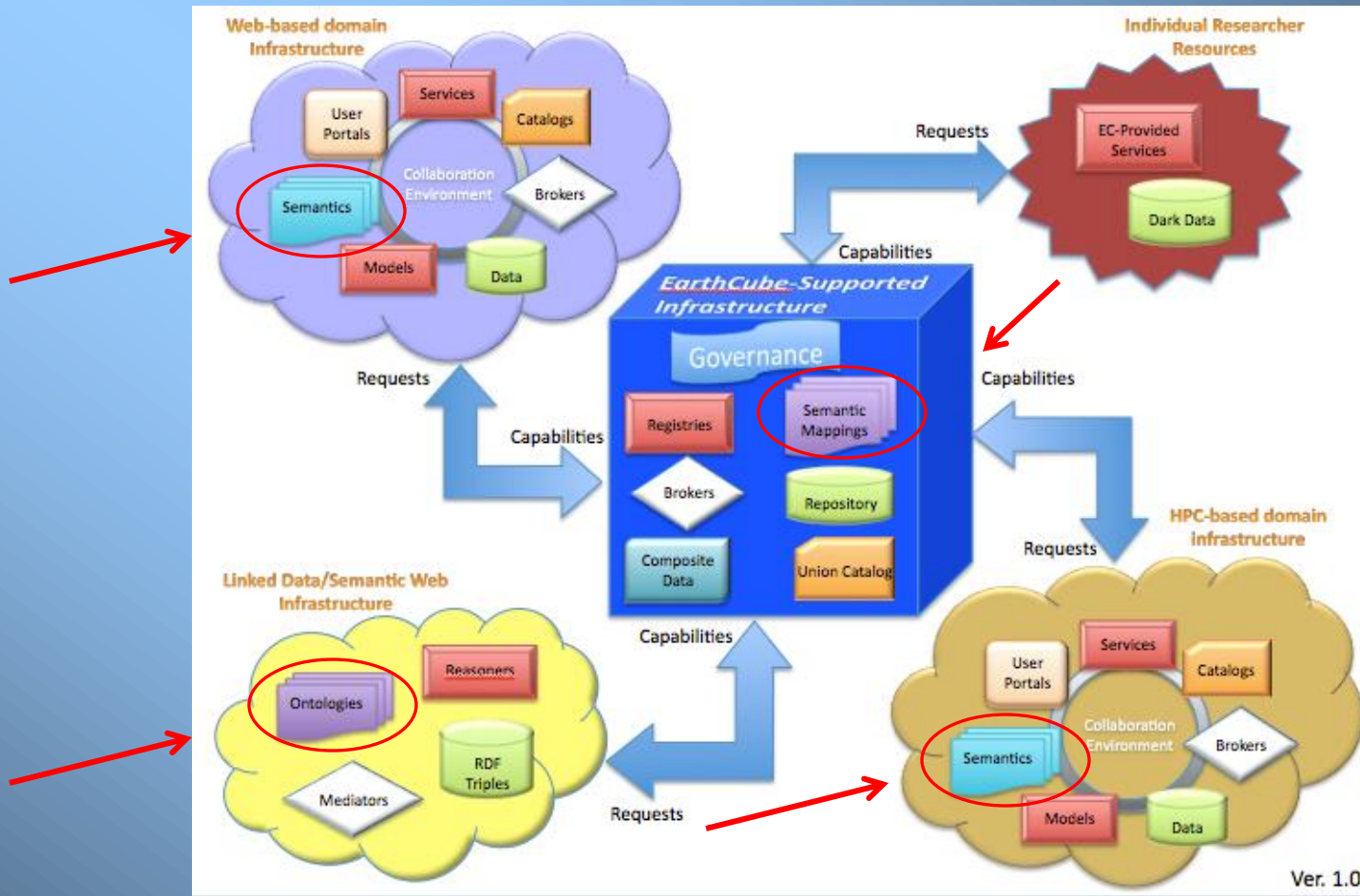
- development and use of ontologies to standardize the meaning of terms,
- support the use of standards,
- resolve heterogeneous terms as well as resolve terms across subdomains (bridging),
- understanding metadata,
- provenance-aware services.

From <http://earthcube.ning.com/page/community-groups>

Need for Semantic Interoperability



Semantic Aspects in EarthCube



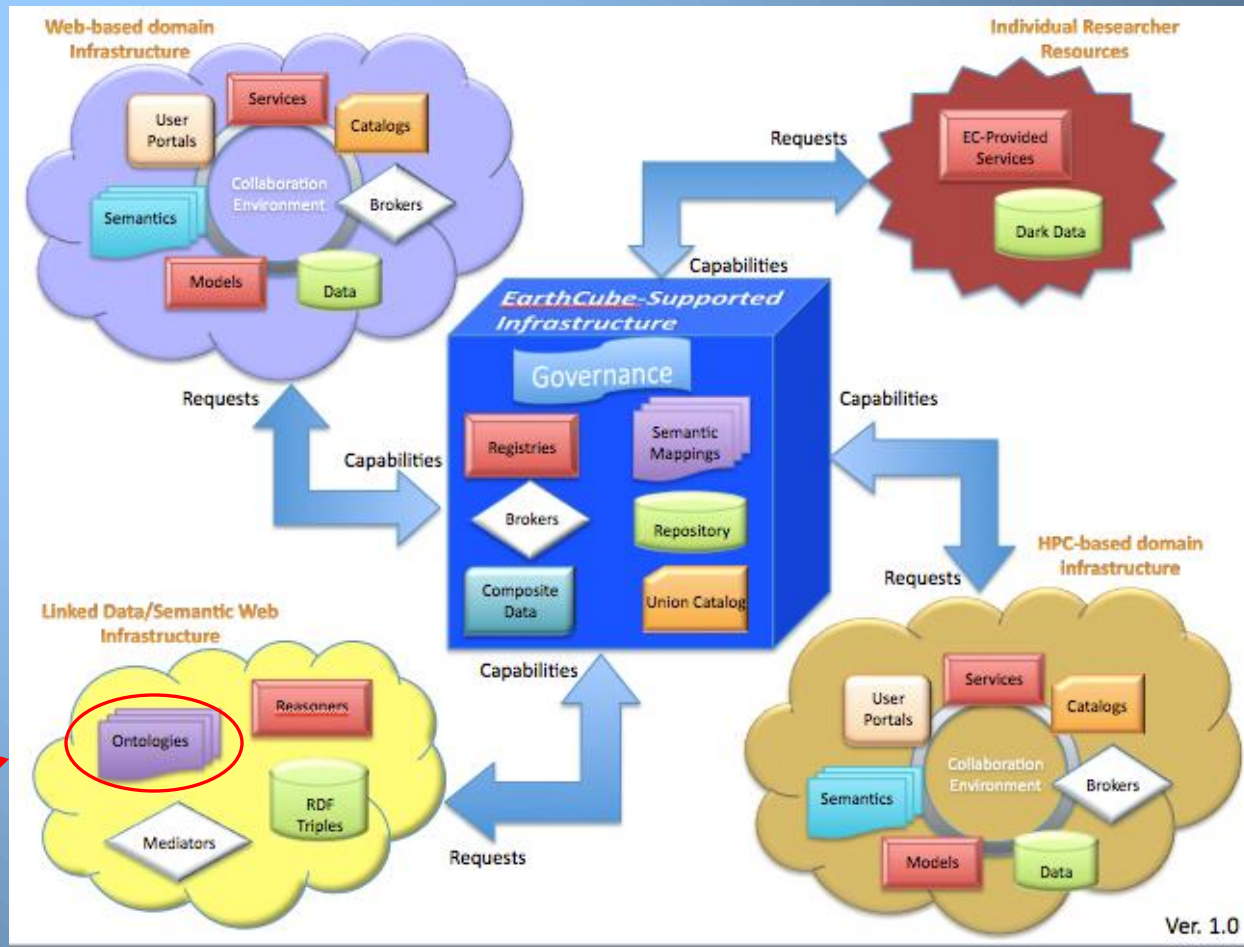
An Architecture Framework

From 00 Oct.4 and 5 Proceedings.final.docx

<https://docs.google.com/file/d/0B6ovZrDPKFGuRS16Znp1ZWx1WW8/edit>

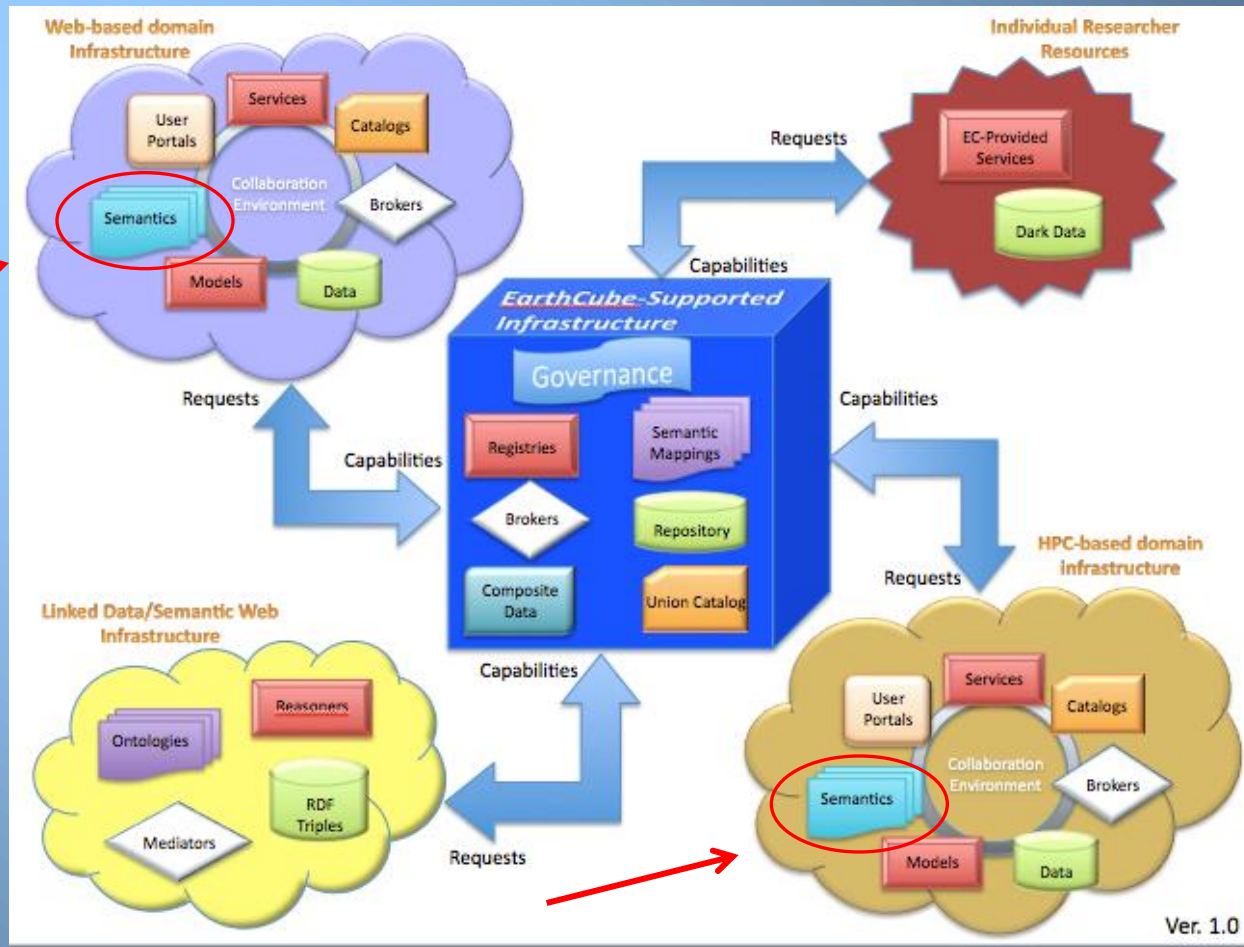
Slide 6

Ontologies



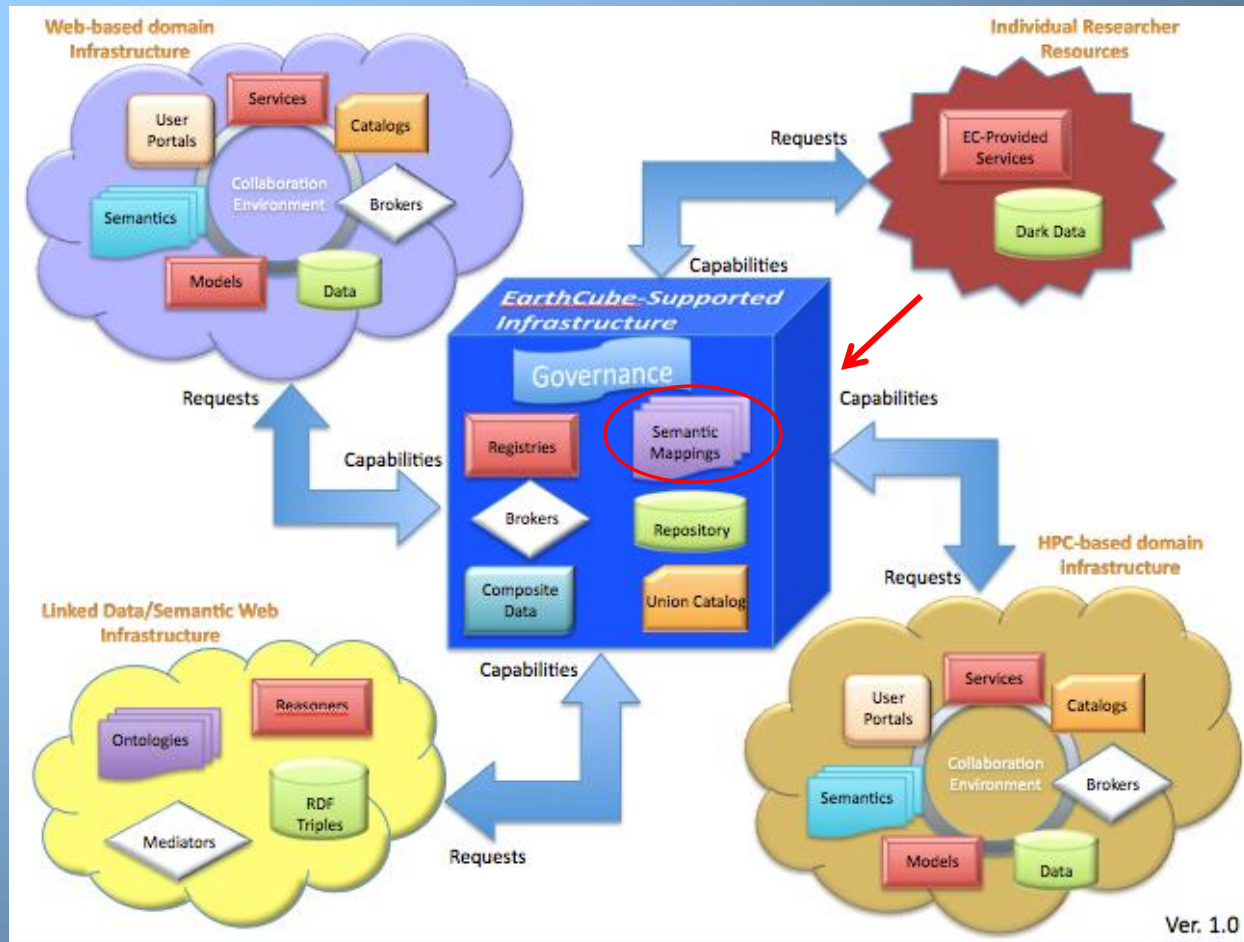
Ontologies would be created for each domain in EarthCube (e.g., sub-domains of hydrosphere, geosphere, biosphere, atmosphere). Ontologies are descriptions of terms, concepts, and relationships in a domain. Ontologies can be used for organization and also used to supply terms for newly generated data and to resolve legacy terms. Leo Obrst will discuss ontologies.

Semantics



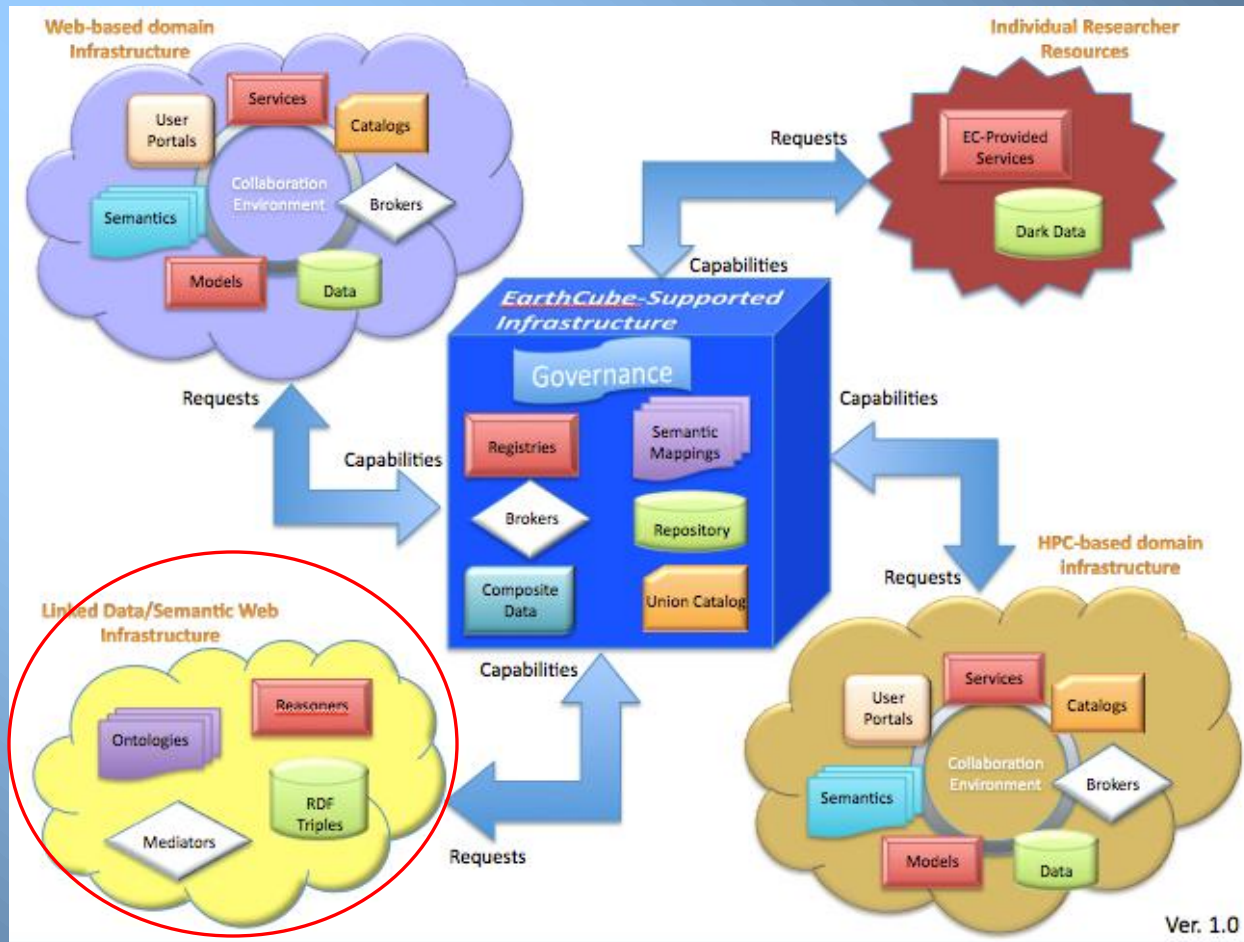
Each self-contained subsystem will need to handle semantics. I believe that the semantics boxes in this picture are place-holders for a full semantic system with ontologies, mappings, reasoners, and related software.

Semantic Mappings



Semantic mappings are files containing mappings between terms used in local datasets and agreed-upon global terms to use in EarthCube.

Linked (RDF) Data in EarthCube



This separate cloud indicates the explicit use of RDF triples. Legacy data may be converted to RDF from a database or spreadsheet format, and new data may be recorded in RDF. The data can then be queried over the Web directly using the SPARQL query language for RDF. Dave Kolas will present GeoSPARQL, which has spatial functions added to SPARQL.