Ontohub.org - a web platform for distributed and heterogeneous ontologies

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OOR meeting

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Ontohub: Repository for Distributed Ontologies

Available at: http://ontohub.org
Development branch at: http://develop.ontohub.org
Sources: http://github.com/ontohub/ontohub

- Ontohub is an **ontology repository engine** with a **web frontend**
- specialized on managing **distributed ontologies**
  - OMG standardization initiative “Ontology, Specification and Modeling Integration and Interoperability”
    - http://ontoiop.org
  - OMG RFP OntoIOp forthcoming
  - Envisaged answer to OMG OntoIOp RFP: Distributed Ontology, Specification and Modeling Language (DOL)
  - Distributed means: **logically heterogeneous, modular, interlinked, annotated, and distributed over the Web.**
Single and Distributed Ontologies

Ontohub supports **single** ontologies in the following languages:
- **OWL** (RDF/XML works best)
- **Common Logic** (CLIF works best)
- **Propositional Logic**
- **First-order Logic** (CASL, TPTP)
- **Higher-order Logic** (THF)
- **Modal logic**

and **distributed** ontologies in
- **DOL** (Distributed Ontology Language)
- **HetCASL** (Heterogeneous Common Algebraic Specification Language)
Ontohub’s notion of an ontology is **generic**:

- a set of **symbols**
- each symbol has a **kind**:
  - in OWL: Class, ObjectProperty, DataProperty
  - in Common Logic: name, sequence marker
  - in first-order logic: predicate symbol, function symbol
- and a set of **sentences** (axioms, definitions, theorems)
- in some ontology **language**

Semantics: theory of **institutions** (see OntoIOP/DOL)

All objects identified by IRIs, can have **metadata** and **comments** (only supported for ontologies so far).
Ontohub’s Notion of Repository

- Single and distributed ontologies are stored in git repositories
- git repositories can be accessed via
  - any git client (git clone, git pull, git push, ...)
  - the web frontend
- right management is per repository
- private repositories are possible
- repositories can be mirrored (e.g. BioPortal, COLORE, SOCoP)
  - git repositories
  - subversion repositories
  - BioPortal instances (via BioPortal API)
State of Development

- 4 programmers, 2 ruby on rails consultants, 3 ontologists
- sources under AGPL, see http://github.com/ontohub/ontohub
- implemented a small but essential subset of the OOR requirements (http://ontolog.cim3.net/cgi-bin/wiki.pl?OpenOntologyRepository_Requirement)
- recently integrated git as a version control backend
Current Architecture

Ontohub:

REST
Apache/Rails

Administration

Presentation

ActionView

Workflow

ActionController

Find

Inference

ActiveRecord

Tomcat/Solr

Hets

Persistence

PostgreSQL

Filesystem

git

OOR:

Revised Architecture

http://ontolog.cim3.net/cgi-bin/wiki.pl?
OpenOntologyRepository_Architecture/Candidate03#
nid2MUD
Future Architecture

Overview & Requirements

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Ontohub Platform for Distributed Ontologies

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Try the public website: http://ontohub.org
New version with more features: http://develop.ontohub.org
## Demo II (Logics)

85 logics currently available

<table>
<thead>
<tr>
<th>Name</th>
<th>IRI</th>
<th>63 distributed Ontologies</th>
<th>417 child Ontologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>(heterogeneous) Distributed Ontologies</td>
<td><a href="http://purl.net/dol/logics/CASL">http://purl.net/dol/logics/CASL</a></td>
<td>2774 Ontologies</td>
<td>with 233 distributed Ontologies</td>
</tr>
<tr>
<td>CommonLogic</td>
<td><a href="http://purl.net/dol/logics/CommonLogic">http://purl.net/dol/logics/CommonLogic</a></td>
<td>1476 Ontologies</td>
<td>with 6 distributed Ontologies</td>
</tr>
<tr>
<td>OWL2</td>
<td><a href="http://purl.net/dol/logics/OWL2">http://purl.net/dol/logics/OWL2</a></td>
<td>807 Ontologies</td>
<td>with 40 distributed Ontologies</td>
</tr>
<tr>
<td>SoftFOL</td>
<td><a href="http://purl.net/dol/logics/SoftFOL">http://purl.net/dol/logics/SoftFOL</a></td>
<td>337 Ontologies</td>
<td>with 0 distributed Ontologies</td>
</tr>
<tr>
<td>HasCASL</td>
<td><a href="http://purl.net/dol/logics/HasCASL">http://purl.net/dol/logics/HasCASL</a></td>
<td>324 Ontologies</td>
<td>with 38 distributed Ontologies</td>
</tr>
<tr>
<td>CoCASL</td>
<td><a href="http://purl.net/dol/logics/CoCASL">http://purl.net/dol/logics/CoCASL</a></td>
<td>105 Ontologies</td>
<td>with 2 distributed Ontologies</td>
</tr>
<tr>
<td>Propositional</td>
<td><a href="http://purl.net/dol/logics/Propositional">http://purl.net/dol/logics/Propositional</a></td>
<td>73 Ontologies</td>
<td>with 5 distributed Ontologies</td>
</tr>
<tr>
<td>EnCL</td>
<td><a href="http://purl.net/dol/logics/EnCL">http://purl.net/dol/logics/EnCL</a></td>
<td>54 Ontologies</td>
<td>with 8 distributed Ontologies</td>
</tr>
</tbody>
</table>

http://develop.ontohub.org/logics
Overview & Requirements

Demo III (Logic OWL)

http://develop.ontohub.org/logics/15

OWL2

Defined by:

Standardization status:

Description

Ontologies using this logic

- Conser
- NotConser
- http://purl.obolibrary.org/obo/bfo.owl
- http://www.loa-cnrs.it/ontologies/SpatialRelations.owl
- http://www.loa-cnrs.it/ontologies/DOLCELite.owl
- http://www.loa-cnrs.it/ontologies/TemporalRelations.owl
- Movie
- http://www.loa-cnrs.it/ontologies/ExtendedDNSe.owl__E1

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Demo V (Categories)

Categories

click on one category to see the Ontologies which are in it

- Unclassified
  - Standard method and research technique
  - Space Time and Process
  - Social science journalism and information
  - Services
  - Natural science mathematics and statistics
  - Information and Communication Technology
  - Health and welfare
  - Engineering manufacturing and construction
  - Education
  - Business administration and law
  - Arts and humanities
  - AgricultureForestryFisheriesVeterinary
Future I: Decouple Components

- ontology logic and structure detection currently done by locally installed Hets
- decouple, in OOR architecture spirit: let any RESTful web service offer structure and inference services

Your ideas? https://github.com/ontohub/ontohub/issues
Future II: More Distributedness

Next aspects of **distributed ontologies** to be realized:

- **Links** between ontologies
  - formal interpretations and informal alignments
  - optionally including symbol → symbol maps

- **Linked Data Compliance**
  - download ontologies from Ontohub by URI
  - annotate external ontologies without importing them into Ontohub

Your ideas? https://github.com/ontohub/ontohub/issues