

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

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OTTO VON GUERICKE  
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INFORMATIK

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 OntoOp forthcoming
  - Envisaged answer to OMG OntoOp 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 Ontology

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 OntoOp/DOL)

All objects identified by IRIs, can have **metadata** and **comments** (only supported for ontologies so far).

# Ontohub's Notion of Repository

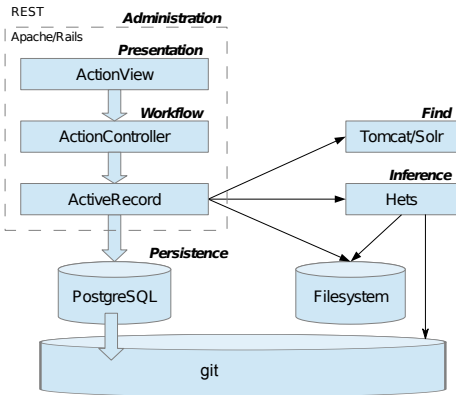
- Single and distributed ontologies are stored in git repositories
- git repositories can be accessed via
  - any git client (git clone, git pull, git push, ...)
  - the web frontend
- right management is per repository
- private repositories are possible
- repositories can be mirrored (e.g. BioPortal, 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](http://ontolog.cim3.net/cgi-bin/wiki.pl?OpenOntologyRepository_Requirement))
- recently integrated git as a version control backend

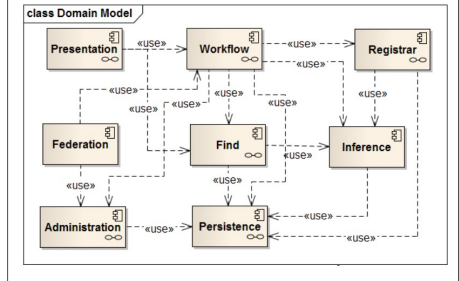
# Current Architecture

## Ontohub:



## OOR:

### Revised Architecture

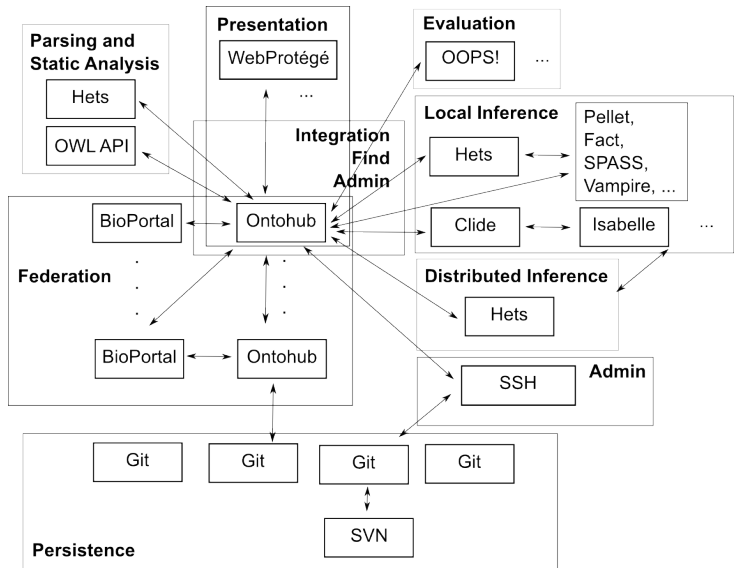


[http://ontolog.cim3.net/cgi-bin/wiki.pl?](http://ontolog.cim3.net/cgi-bin/wiki.pl?OpenOntologyRepository_Architecture/Candidate03#nid2MUD)

[OpenOntologyRepository\\_Architecture/Candidate03#](#)

[nid2MUD](#)

# Future Architecture





# Demo I (Start Page)

Try the public website:  
<http://ontohub.org>  
 New version with more  
 features:  
<http://develop.ontohub.org>

The screenshot shows the MyOntohub website interface. At the top, there is a navigation bar with the MyOntohub logo and links for Register, Ontologies, Categories, Login, and Logout. Below the navigation bar, the main content area features the Ontohub logo and a brief description: "Open - based on open source software", "Flexible - combine different logics in the same ontology", and "Distributed - combine distinct ontologies into a single one". A key feature is highlighted: "With 8344 ontologies and 18 repositories, continuously growing!". There are two "Learn more" buttons. To the right, there is a sign-up form with fields for Email, Password, Name, and a "Sign up" button. Below the sign-up form, there are two sections: "Recently Updated Repositories" and "Recently Updated Ontologies", each with a list of items and a "View" button. The footer contains links for Contact, Privacy Policy, and About, and a note about the Open-Drinking Repository (ODR) initiative.

# Demo II (Logics)

<http://develop.ontohub.org/logics>

MyOntohub Repositories Ontologies Categories **Logics** Mappings Sign in Sign up

## Logics

85 logics currently available

1 2 3 4 Next Last

25 per page

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

oec03a4 Foo Institute About Open Ontology Repository (OOR) Initiative

# Demo III (Logic OWL)

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

The screenshot shows a web browser window displaying the MyOntohub interface. The address bar shows the URL `develop.ontohub.org/logics/19?tab=ontologies`. The navigation menu includes: MyOntohub, Repositories, Ontologies, Categories, **Logics**, Mappings, Users, Teams, Jobs, and admin. The main content area is titled "OWL2" and includes a "Defined by:" field, a "Standardization-status:" field, and a "Description" field. There are "Edit" and "Delete" buttons. Below the description, there are tabs for "Mappings", "Supports", "Ontologies 807", "homogeneous Distributed Ontologies 40", "heterogeneous Distributed Ontologies 18", and "Graph". The section "Ontologies using this logic" lists several ontologies with their URIs and icons: Conser, NotConser, `http://purl.obolibrary.org/obo/bfo.owl`, `http://www.loa-cnr.it/ontologies/SpatialRelations.owl`, `http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl`, `http://www.loa-cnr.it/ontologies/TemporalRelations.owl`, Movie, and `http://www.loa-cnr.it/ontologies/ExtendedDnS.owl__E1`. The footer contains "cec03a4", "Foo Institute", "About", and "Open Ontology Repository (OOR) Initiative".

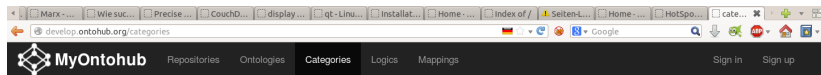
# Demo IV (Repositories)

The screenshot shows a web browser window displaying the MyOntohub website. The page title is "Repositories" and it indicates "18 repositories currently available". The list of repositories includes:

- Bioportal**: Mirror of <http://bioportal.bioontology.org/> with all ontologies below 5 megabytes.
- Colore**: Mirror of <http://colore.googlecode.com/>
- Colore-algebra**: small extract of COLORE for testing purposes
- Common Logic Structural Ontology**: The following relations and functions are axiomatized: allEqual, firstDifferent, allDifferent, equalSequences, reflexive, irreflexive, quasiReflexive, symmetric, antisymmetric, asymmetric, transitive, distributive, commutative, functional, unaryRelation, binaryRelation, ternaryRelation, disjoint, firstDisjoint, pairwiseDisjoint, subontology, subseries, equivalentRelation, distributive, AND, OR, NOT, idempotent, range, injective, surjective, bijective
- Hets-ib**: Mirror of <https://svn.agsib.informatik.uni-bremen.de/Hets-ib/>
- Hets-ib-Basic**: mirror of <https://svn.agsib.informatik.uni-bremen.de/Hets-ib/trunk/Basic>
- Hets-ib-manual**: Since the svn import leads to lots of failed ontologies, I try a manual import, file by file.
- OOR Ontohub API**: Mirror of [https://github.com/ontohub/OOR\\_Ontohub\\_API](https://github.com/ontohub/OOR_Ontohub_API)
- PROMULUS**: Mirror of <http://www.theclix.co.za/PROMULUS/> PROMULUS is a foundational ontology repository aimed at improving semantic interoperability. Currently there are three foundational ontologies in the repository: DOLCE, SFO and GFO.
- Sandbox**
- Sandbox clone**: mirror of [git://develop.ontohub.org/sandbox.git](http://develop.ontohub.org/sandbox.git)
- SOCuP**: Mirror of the SOCuP OOR from <http://socup.soc.nyu/>
- Some private repo**
- Spaceportal**: Mirror of <https://github.com/okut/spaceportal>
- ssh\_test1**: Testing some ssh stuff
- ssh\_test2**: another ssh\_testing repo.
- ssh\_test3**: Another salteel. Now completely clean.
- TONES**: Mirror of the TONES Ontology Repository <http://rpc2f.co.uk:8080/repository/browse/>

At the bottom of the page, there is a footer with the text "cec334 Foo Institute About" on the left and "Open Ontology Repository (OOR) Initiative" on the right.

# Demo V (Categories)



The screenshot shows a web browser window with the URL `develop.ontohub.org/categories`. The browser's address bar and tabs are visible at the top. Below the browser, the MyOntohub website header is shown, featuring a navigation menu with the following items: [MyOntohub](#), [Repositories](#), [Ontologies](#), [Categories](#) (the active page), [Logics](#), and [Mappings](#). On the right side of the header, there are links for [Sign in](#) and [Sign up](#).

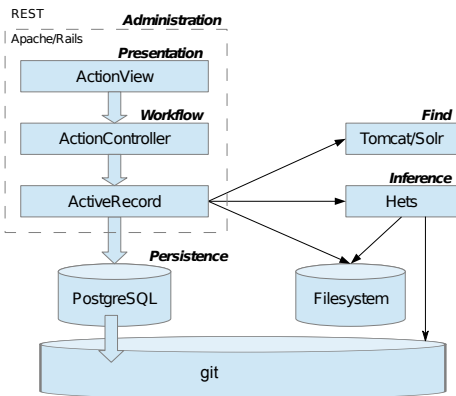
## Categories

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
- AgricultureForestryFsheriesVeterinary

# 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>