



# **FactForge**

## **Data Service and the Value of Inferred Knowledge**

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*European Open Data Forum  
June 2012*

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# Ontotext

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- Top-5 provider of core Semantic Technology
- Established in year 2000; offices in Bulgaria, UK, USA
- Active both in research and commercial projects
- **360° semantic technology – unique portfolio:**
  - **Semantic Databases:** high-performance RDF DBMS, scalable reasoning
  - **Semantic Search:** text-mining (IE), metadata generation, Information Retrieval (IR)
  - **Web Mining:** focused crawling, screen scraping, data fusion
  - **Linked Data Management and Data Integration**

*Good recognition in the SemTech community*

- Ontotext pages are ranked #1 for “semantic annotation” and “semantic repository” at GYM, #3 for “linked data management” at Google

*Several joint ventures and subsidiaries*

- Innovantage: leading online recruitment intelligence provider in UK

# Ontotext Clients (selected)

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## British Broadcasting Corporation (BBC)

- Run its World Cup 2010 sites on top of OWLIM
- Since Mar'12 BBC Sports and 2012 Olympics sections are driven by OWLIM and a Concept Extraction service developed by Ontotext



## Press Association (UK)

- Analysis of Sports news
- Concept extraction
- Linked data generation

## Top-3 USA media (not allowed to name)



**The National Archives (UK)** contracted Ontotext to implement semantic KB and semantic search for the Government Web Archive



**British Museum (UK)** Ontotext leads the development of Phase 3 of ResearchSpace project on collaborative research in cultural heritage; British Museum's public SPARQL end-point is powered by OWLIM



**de Bibliotheek (Holland)** aggregation of data from 150 library databases



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Linked Open Data is maturing

LOD cloud grows by billions of triples yearly

Technologies and guidelines about

how to produce linked data fast

how to assure their quality

how to provide vertical oriented data services

LOD2, LATC, baseKB

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This talk is about

reasoning

and


coping with diversity of the data on the web of data

# Outline

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- FactForge (beta)
- Reference Layer
- Access Modes
- Querying
  - Airports around London
  - US city – a subject of a Novel
  - US city – contactInformation
- Challenges
- Conclusion

# FactForge (beta)

RDF Search and Explore | SPARQL | RelFinder | About | Contact |

FactForge represents a [reason-able view](#) to the [web of data](#). It aims to allow users to find resources and facts based on the semantics of the data, like web search engines index WWW pages and facilitate their usage.

RDF Search and Explore

Keyword search retrieves a ranked list of RDF molecules. The automatic suggestions allow direct exploration of URIs. Structured queries can be defined using a [SPARQL query](#).

### Repository overview

Engine: OWLIM SE 5.0	Information: <a href="http://ontotext.com/factforge">http://ontotext.com/factforge</a>
Inference ruleset: factforge.pie ( <a href="#">more</a> )	Number of statements: 3,126,004,378 ( <a href="#">Dataset statistics</a> )
Number of expl. statements: 1,860,804,539	Number of distinct retrievable statements: 12,646,674,554
Number of entities: 536,242,324	Number of URIs: 205,396,533
Number of Literals: 269,814,590	Number of Bnodes: 61,031,201

the largest body of heterogeneous general knowledge on which inference has been performed

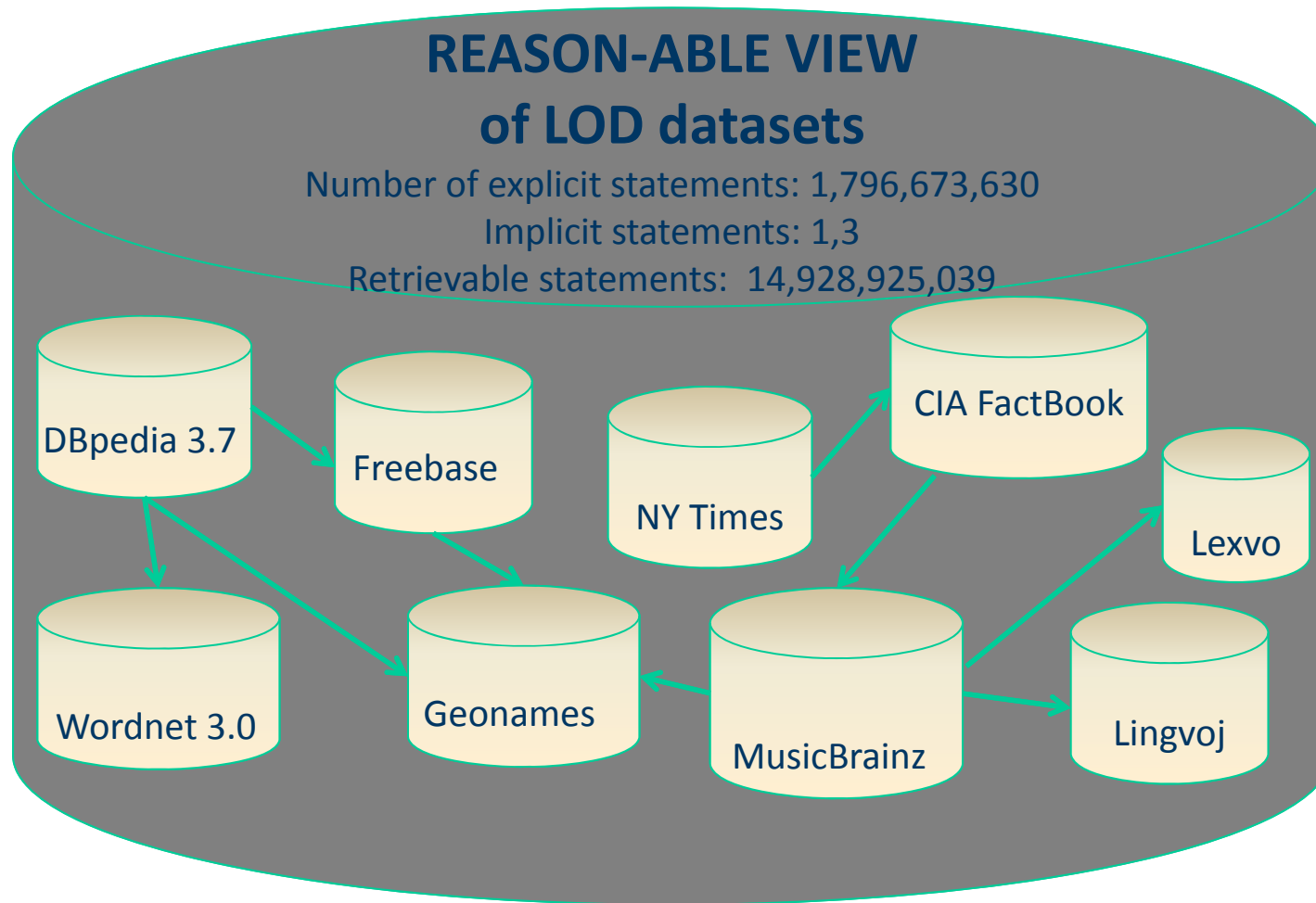
– powered by **OWLIM 5.0**



– supporting **SPARQL 1.1**

# Datasets

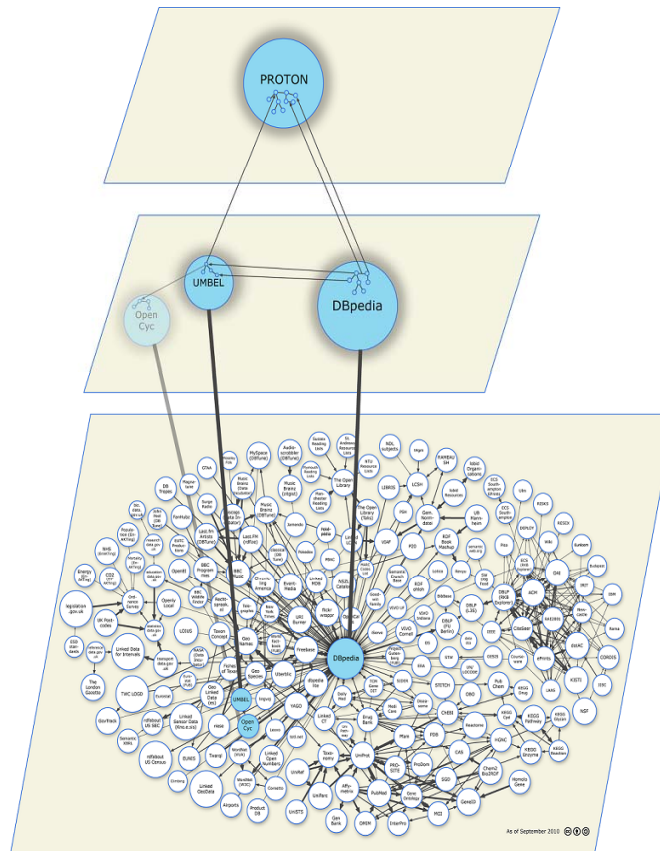
---



materialization is performed with respect to the semantics of OWL-Horst optimized



# Reference Layer



PROTON – light weight upper level ontology  
~500 classes, ~150 properties  
<http://www.ontotext.com/proton-ontology>

Linking at schema level:

- (1) using `rdfs:subClassOf` and `rdfs:subPropertyOf` statements;
- (2) using OWL expressions where there is a difference in the conceptualization
- (3) using inference rules if additional individuals are necessary in the repository to support the mapping

# Access modes

**RDF Search** - retrieve ranked list of URIs related to literals, which contain specific keywords

The screenshot displays the FactForge web interface. At the top left is the FactForge logo with a 'beta' tag. Navigation links include 'RDF Search and Explore', 'SPARQL', 'RelFinder', 'About', and 'Contact'. A brief description states: 'FactForge represents a [reason-able view](#) to the [web of data](#). It aims to allow users to find resources and facts based on the semantics of the data, like web search engines index WWW pages and facilitate their usage.'

The 'RDF Search and Explore' section features a search input field containing 'Copenhagen Denmark' and a 'Search' button. Below the input, it notes: 'Keyword search retrieves a ranked list of RDF molecules. The automatic suggestions allow direct exploration of URIs. Structured queries can be defined using a [SPARQL query](#).'

The 'Repository overview' section contains a table with the following data:

Engine: OWLIM SE 5.0	Information: <a href="http://ontotext.com/factforge">http://ontotext.com/factforge</a>
Inference ruleset: factforge.pie ( <a href="#">more</a> )	Number of statements: 3,066,787,172 ( <a href="#">Dataset statistics</a> )
Number of expl. statements: 1,796,673,630	Number of retr. statements: 14,928,925,039
Number of entities: 507,083,596	Number of URI: 203,284,583
Number of Literals: 266,753,728	Number of Bnodes: 61,032,945


The search results section, titled 'Search', shows the same search input and button. Below it, it indicates 'Results for "Copenhagen Denmark" (10 of 10)'. The results are a list of five entries, each consisting of a blue link 'Copenhagen (Denmark)' with an 'RDF Rank' icon, followed by the source URL:

- Source: <http://dbpedia.org/resource/Copenhagen>
- Source: <http://rdf.freebase.com/ns/en.copenhagen>
- Source: [http://data.nytimes.com/copenhagen\\_denmark\\_geo](http://data.nytimes.com/copenhagen_denmark_geo)
- Source: <http://data.nytimes.com/N76963119569157704581>
- Source: <http://el.dbpedia.org/resource/Kontzkydvn>
- Source: <http://de.dbpedia.org/resource/Kopenhagen>

# Access modes (condt)

## Exploration - traversing the data, one resource at a time

FactForge<sup>®</sup> RDF Search and Explore | SPARQL | ReIFinder | About | Contact



### Copenhagen (Denmark) RDF Rank

Copenhagen is the capital and largest city of Denmark, with an urban population of 1,199,224 (as of 1 January 2011&#160) and a metropolitan population of 1,918,062 (as of 1 April 2011&#160)...

Source: <http://dbpedia.org/resource/Copenhagen>

Same as: [fb:en.copenhagen](#), [nytimes:copenhagen denmark geo](#), [nytimes:N76963119569157704581](#), [http://el.dbpedia.org/resource/Κοπεγχάγη](#), [http://de.dbpedia.org/resource/Kopenhagen](#), [dbpedia:Copenaqhen](#), [http://sws.geonames.org/2618425/](#), [yaqo:Copenhagen](#), [w-flickr:Copenhagen](#), [fb:m.01lfy](#), [dbpedia:Copenhagen](#)

RDF Search and Explore

Statements in which the resource exists as a subject. Named Graph  Language  Inference

Predicate	Object
rdfs:type	dbp-ont:Place, dbp-ont:PopulatedPlace, dbp-ont:Settlement, dbpedia:City, http://schema.org/City, http://schema.org/Place, umberl-rc:Location_Underspecified, umberl-rc:Location_Underspecified
fb:type.object.type	fb:base.biblioness.bibs_location, fb:base.biblioness.bibs_topic, fb:base.ontologies.ontology_instance, fb:base.starshapedcitadelsandcities.star_shaped_cities_and_cities
rdfs:seeAlso	dbpedia:Copenhagen
rdfs:isDefinedBy	<a href="http://sws.geonames.org/2618425/about.rdf">http://sws.geonames.org/2618425/about.rdf</a>
rdfs:comment	Copenhagen is the capital and largest city of Denmark, with an urban population of 1,199,224 (as of 1 January 2011&#160) and a metropolitan population of 1,918,062 (as of 1 April 2011&#160). It is also the largest city in Denmark with 1,181,000 inhabitants living in the urban area. Copenhagen is on the islands of Zealand and Amager.
rdfs:label	Copenhagen@en
foaf:homepage	<a href="http://www.kk.dk/">http://www.kk.dk/</a> , <a href="http://www.kk.dk/english">http://www.kk.dk/english</a> , <a href="http://www.visitcopenhagen.dk/">http://www.visitcopenhagen.dk/</a> , <a href="http://www3.kk.dk">http://www3.kk.dk</a> , <a href="http://www3.kk.dk/">http://www3.kk.dk/</a>

# Access modes (condt)

**Exploration** - traversing the data, one resource at a time, inspecting inferred knowledge

- locatedIn – Denmark, Northern Europe
- Geonames types/FeatureCodes P.PPL
- parentFeature – Denmark, Europe
- ...

FactForge<sup>®</sup> RDF Search and Explore | SPARQL | ReFinder | About | Contact

**Copenhagen (Denmark)** RDF Rank

Copenhagen is the capital and largest city of Denmark, with an urban population of 1,199,224 (as of 1 January 2011&#160;) and a metropolitan population of 1,918,062 (as of 1 April 2011&#160;)...

Source: <http://dbpedia.org/resource/Copenhagen>

Same as: [fb:en.copenhagen](#), [nytimes:copenhagen\\_denmark\\_geo](#), [nytimes:NY696311956915704581](#), [http://el.dbpedia.org/resource/Κορυχά...](#), [http://de.dbpedia.org/resource/Κοπεγχάγη](#), [http://en.dbpedia.org/resource/Copenhagen](#), [http://es.dbpedia.org/resource/Copenhague](#), [http://svs.geonames.org/2618425/](#), [vago:Copenhagen](#), [w:flickr:Copenhagen](#), [fbm:01fb](#), [dbpedia:Copenhagen](#)

Statements in which the resource exists as a subject. Named Graph: All Language: English Inference: Explicit and implicit


Predicate	Object
rdf:type	dbp-ont:Place, dbp-ont:PopulatedPlace, dbp-ont:Settlement, dbpedia:City, http://schema.org/City, http://schema.org/Place, umbel-rc:Location_Underspecified, umbel-rc:Location
ptop:locatedIn	Copenhagen@en, dbpedia:Denmark, dbpedia:Europe, dbpedia:Nordic_countries, dbpedia:Northern_Europe, dbpedia:Scandinavia, http://svs.geonames.org/2618424/, http://svs.geonames.org/2618425/
fb:type.object.type	fb:base:bibliioness:bibs_location, fb:base:bibliioness:bibs_topic, fb:base:ontologies:ontology_instance, fb:base:starshapedcitadelsandcities:star_shaped_cities_and_citadels
rdfs:seeAlso	dbpedia:Copenhagen, http://svs.geonames.org/2618425/about.rdf
skos:altLabel	Copenhagen@en, Kjobenhavn
dc:type	geo-ont:P, geo-ont:P.PPLC
dc:form.type	geo-ont:P, geo-ont:P.PPLC
dbp-ont:areaTotal	8.825E7
dbp-ont:areaUrban	4.5561E8
dbp-ont:country	dbpedia:Denmark, w:flickr:Danska
geo-ont:locationMap	http://www.geonames.org/2618425/copenhagen.html, http://www.geonames.org/2618425/copenhagen.html
geo-ont:population	1153615, 1153615
geo-ont:inCountry	http://www.geonames.org/countries/#DK
geo-ont:parentFeature	dbpedia:Denmark, dbpedia:Europe, http://svs.geonames.org/2618424/, http://svs.geonames.org/2618424/, http://svs.geonames.org/6295630/, w:flickr:Region_Hovedstaden
geo-ont:nearbyFeatures	http://svs.geonames.org/2618425/nearby.rdf, http://svs.geonames.org/2618425/nearby.rdf

# Access modes (condt)

**Exploration** - traversing the data, one resource at a time, inspecting inferred knowledge

- locatedIn - Europe
- subRegionOf - Europe
- hasContactInfo - website via Freebase
- containsLocation
- ...

FactForge
RDF Search and Explore | SPARQL | ReIFinder | About | Cont



Größgliederung Europas  
nach Nationalstaaten  
nach Kultur-linguistischen Kriterien

## Northern Europe RDF Rank

(marked blue): Northern Europe Western Europe Eastern Europe Southern Europe]] Northern Europe is the northern part or region of Europe

Source: [http://dbpedia.org/resource/Northern\\_Europe](http://dbpedia.org/resource/Northern_Europe)

Same as: <http://de.dbpedia.org/resource/Nordeu...>, [yago:Northern\\_Europe](http://yago:Northern_Europe), [w.flickr:Northern\\_Europe](http://w.flickr:Northern_Europe), [fb:m.01531v](http://fb:m.01531v), [dbpedia:Northern\\_Europe](http://dbpedia:Northern_Europe)

RDF Search and Explore

Statements in which the resource exists as a subject. Named Graph  Language  Inference

Predicate	Object
rdfs:type	psys:Location, psys:Entity, ptop:Location, ptop:Object, rdfs:Resource
ptop:locatedIn	dbpedia:Europe, http://sws.geonames.org/6295630/
psys:mainLabel	Northern Europe@en
ptop:hasContactInfo	fb:m.09xsfyj
ptop:partOf	dbpedia:Europe, http://sws.geonames.org/6295630/
ptop:subRegionOf	dbpedia:Europe, http://sws.geonames.org/6295630/
pext:containsLocation	dbpedia:Hammel, dbpedia:Sakskøbing, dbpedia:Vågå, dbpedia:Sokndal, dbpedia:Kvitøy, dbpedia:Frøya_Norway, dbpedia:Jakobstad, dbpedia:Hudiksvall_County, dbpedia:Sund_Norway, dbpedia:Mikkeli, dbpedia:Ostróda, dbpedia:Edsberg_Sollentuna, dbpedia:Sandum, dbpedia:Äriküla, dbpedia:Masmo, dbpedia:Köyliönjärvi, dbpedia:Høyenhall_station, dbpedia:Bernstorffsvej_station, dbpedia:Stångån, dbpedia:Strängnäs, dbpedia:Allhelgonakyrkan, dbpedia:Montebello_station, dbpedia:Øversjødalen, dbpedia:Galtsjøen, dbpedia:Storrenden,

# Access modes (condt)

## SPARQL endpoint

The image shows three overlapping screenshots of the FactForge SPARQL endpoint interface. The top-left screenshot shows the query input area with a 'Namespaces' dropdown and checkboxes for 'Include inferred' and 'Expand results over equivalent URIs'. The middle screenshot shows the same interface with a SPARQL query entered: 

```
1 # Software companies founded in the US (PROTON)
2 PREFIX rdf:<http://www.w3.org/1999/02/22-rdf-syntax-ns#>
3 PREFIX dbpedia:<http://dbpedia.org/resource/>
4 PREFIX pext:<http://www.ontotext.com/proton/protonext#>
5 PREFIX ptop:<http://www.ontotext.com/proton/protonptop#>
6
7 SELECT DISTINCT ?Company ?Location
8 WHERE {
9   ?Company rdf:type pext:Company ;
10            pext:industryOf dbpedia:Computer_software ;
11            ptop:establishedIn ?Location .
12   ?Location ptop:subRegionOf dbpedia:United_States
13 }
```

 The bottom-right screenshot shows the results for the query, displaying a table with two columns: 'Company' and 'Location'. The results are as follows:

Company	Location
dbpedia:IBS_America	dbpedia:Lexington_Massachusetts
dbpedia:Parature	dbpedia:Ithaca_New_York
dbpedia:Redexpress	dbpedia:Glen_Allen_Missouri
dbpedia:Redexpress	dbpedia:St_Louis_Missouri
dbpedia:Botland	dbpedia:California
dbpedia:Interwoven	dbpedia:Sunnyvale_California
dbpedia:Lawson_Software	dbpedia:Minneapolis
dbpedia:Incinerator_Studios	dbpedia:Carlsbad_California
dbpedia:Surf_Canyon	dbpedia:Oakland_California
dbpedia:GWL_Software	dbpedia:Portland_Oregon
dbpedia:SlimWare_Utillities	dbpedia:Ocean_Springs_Mississippi
dbpedia:Exterro_Inc.	dbpedia:Oregon
dbpedia:Exterro_Inc.	dbpedia:Portland_Oregon

# Access modes (condt)

## RelFinder

The screenshot shows the FactForge RelFinder interface. On the left, the search panel is titled "between" and contains two input fields: (1) Manchester and (2) Europe. Below these are "add", "clear", and "Find Relations" buttons. A "Filter by:" section shows "relations: (30/30)" and options for "length", "class", "link", and "conne...". A table below the filters shows the number of objects for each filter value:

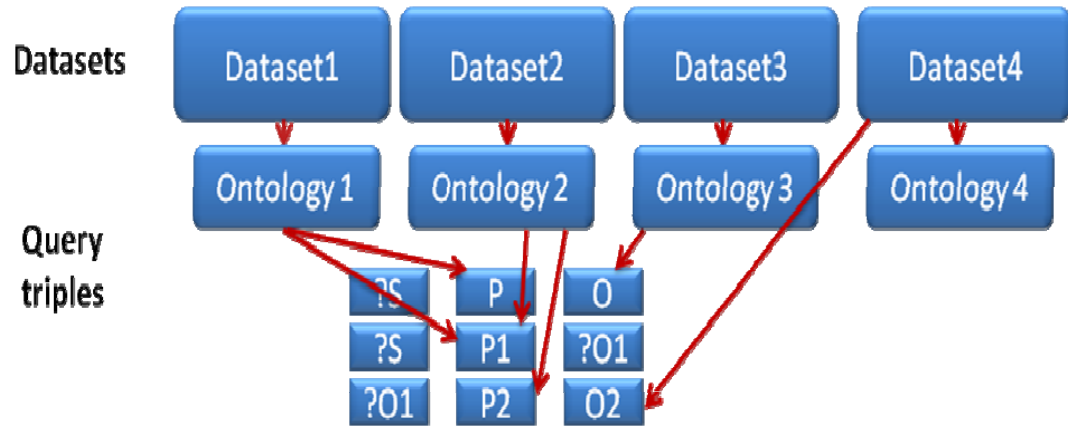
number of objects	num	vi
0	1/1	
1	19/19	
2	10/10	

The main graph area on the right displays a network of nodes and edges. The nodes include Manchester, Europe, Angleterre, BS6879, Manchester (HM...), 2643123, and 3333169. Edges represent relationships such as "land", "parentFeat...", "blankName", "blank1Name", "location.lo...", "southeast", "sameAs", and "homepage". A status bar at the top right indicates "Status: Searching for relations / Building graph" and a "stop delayed graph building" button.

# Querying

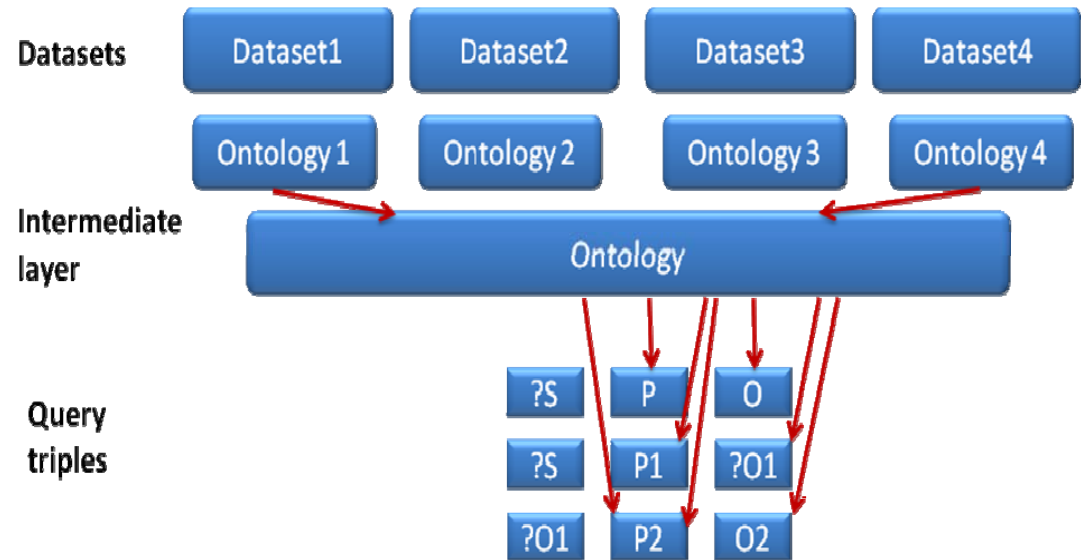
## Using LOD concepts

```
SELECT * WHERE {  
  ?Person dbp-ont:birthPlace ?BirthPlace ;  
    rdf:type dbp-ont:Politician ;  
  ?BirthPlace geo-ont:parentFeature dbpedia:Germany .  
}
```



## Using the intermediary layer

```
SELECT * WHERE {  
  ?Person prot:birthPlace ?BirthPlace ;  
    rdf:type prot:Politicianr ;  
  ?BirthPlace prot:subRegionOf dbpedia:Germany .  
}
```





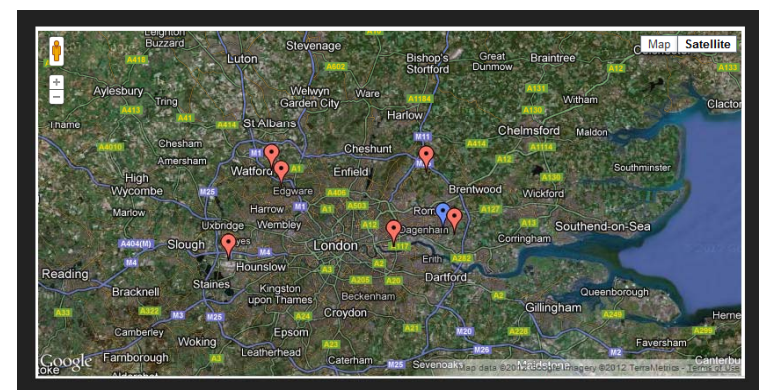
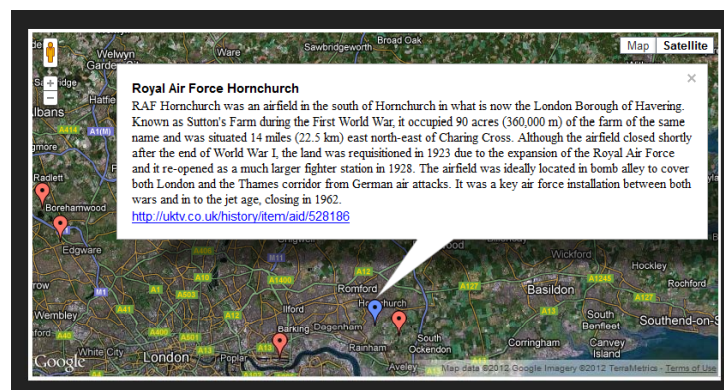
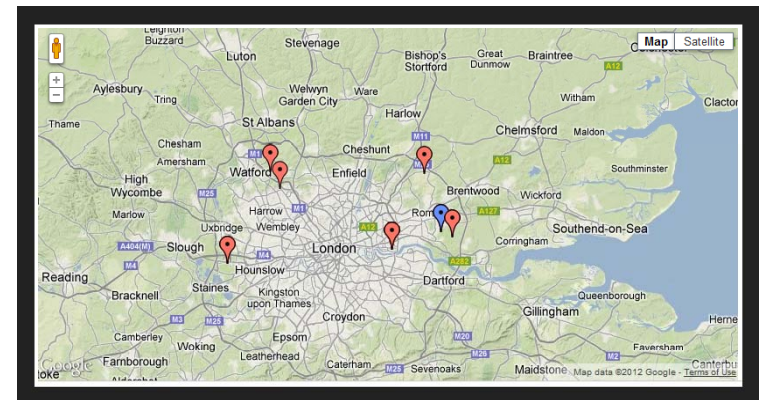
# Find Airports near London

## SPARQL Query

Results for your query (20) - [Edit query](#)

airport	label
dbpedia:London_Heathrow_Airport	London Heathrow Airport@en
dbpedia:London_City_Airport	London City Airport
dbpedia:RAF_Northolt	Royal Air Force Northolt 90px@en
dbpedia:Antwerp_International_Airport	Antwerp International Airport@en
dbpedia:Croydon_Airport	Croydon Airport@en
dbpedia:London_Biggin_Hill_Airport	London Biggin Hill Airport@en
dbpedia:Elstree_Airfield	Elstree Airfield@en
dbpedia:London_Heliport	London Heliport@en
dbpedia:Heston_Aerodrome	Heston Aerodrome@en
dbpedia:Stapleford_Aerodrome	Stapleford Aerodrome@en
dbpedia:North_Weald_Airfield	North Weald Airfield@en
<a href="http://sws.geonames.org/6301524/">http://sws.geonames.org/6301524/</a>	Northolt
dbpedia:Stag_Lane_Aerodrome	Stag Lane Aerodrome@en

Standard LOD vs. PROTON query  
13 vs. 20 results  
DBpedia vs. DBpedia and Geonames



# Find airports near London - Results comparison

## SPARQL Query

Results for your query (13) - [Edit query](#)

airport	label
dbpedia:London_Heathrow_Airport	London Heathrow Airport@en
dbpedia:London_City_Airport	London City Airport
dbpedia:RAF_Northolt	Royal Air Force Northolt 90px@en
dbpedia:Antwerp_International_Airport	Antwerp International Airport@en
dbpedia:Croydon_Airport	Croydon Airport@en
dbpedia:London_Biggin_Hill_Airport	London Biggin Hill Airport@en
dbpedia:Elstree_Airfield	Elstree Airfield@en
<a href="http://dbpedia.org/resource/Elstree_Airfield">http://dbpedia.org/resource/Elstree_Airfield</a>	
dbpedia:London_Heliport	London Heliport@en
dbpedia:Heston_Aerodrome	Heston Aerodrome@en
dbpedia:Stapleford_Aerodrome	Stapleford Aerodrome@en
dbpedia:North_Weald_Airfield	North Weald Airfield@en
dbpedia:Stag_Lane_Aerodrome	Stag Lane Aerodrome@en

## SPARQL Query

Results for your query (20) - [Edit query](#)

airport	label
dbpedia:London_Heathrow_Airport	London Heathrow Airport@en
dbpedia:London_City_Airport	London City Airport
dbpedia:RAF_Northolt	Royal Air Force Northolt 90px@en
dbpedia:Antwerp_International_Airport	Antwerp International Airport@en
dbpedia:Croydon_Airport	Croydon Airport@en
dbpedia:London_Biggin_Hill_Airport	London Biggin Hill Airport@en
dbpedia:Elstree_Airfield	Elstree Airfield@en
dbpedia:London_Heliport	London Heliport@en
dbpedia:Heston_Aerodrome	Heston Aerodrome@en

dbpedia:Heston_Aerodrome	Heston Aerodrome@en
dbpedia:Stapleford_Aerodrome	Stapleford Aerodrome@en
dbpedia:North_Weald_Airfield	North Weald Airfield@en
<a href="http://sws.geonames.org/6301524/">http://sws.geonames.org/6301524/</a>	Northolt
dbpedia:Stag_Lane_Aerodrome	Stag Lane Aerodrome@en
<a href="http://sws.geonames.org/6296597/">http://sws.geonames.org/6296597/</a>	Biggin Hill
<a href="http://sws.geonames.org/6691396/">http://sws.geonames.org/6691396/</a>	London Heathrow Terminal 1
<a href="http://sws.geonames.org/6691397/">http://sws.geonames.org/6691397/</a>	London Heathrow Terminal 2
<a href="http://sws.geonames.org/6691395/">http://sws.geonames.org/6691395/</a>	London Heathrow Terminal 3
<a href="http://sws.geonames.org/2647216/">http://sws.geonames.org/2647216/</a>	London Heathrow Airport@en
<a href="http://sws.geonames.org/6691394/">http://sws.geonames.org/6691394/</a>	London Heathrow Terminal 4

Using Geospatial index of OWLIM

# City – a subject of a science fiction author



**Missouri** RDF Rank

RDF Search and Explore

Source: [http://dbpedia.org/resource/Glen\\_Allen,\\_Missouri](http://dbpedia.org/resource/Glen_Allen,_Missouri)

Same as: [fb:en.missouri](#), [nytimes:missouri\\_geo](#), [nytimes:N34986920251980824741](#), [http://sws.geonames.org/4398678/](#), [http://el.dbpedia.org/resource/Μιζούπ...](#), [http://de.dbpedia.org/resource/Missou...](#), [opencyc:Mx4rvVjBApwpEbGdrcN5Y29ycA](#), [yago:Missouri](#), [yago:Glen\\_Allen,\\_Missouri](#), [http://www4.wiwiss.fu-berlin.de/flick...](#), [http://www4.wiwiss.fu-berlin.de/flick...](#), [http://www4.wiwiss.fu-berlin.de/flick...](#), [dbpedia:Missourian](#), [fb:m.04ych](#), [dbpedia:Missouri](#), [fb:m.0wsrw](#), [dbpedia:Glen\\_Allen,\\_Missouri](#)

Statements in which the resource exists as a subject.

Named Graph  Language  Inference

Predicate	Object
rdf:type	dbp-ont:AdministrativeRegion, dbp-ont:Place, dbp-ont:PopulatedPlace, dbp-ont:Settlement, dbp-ont:Village, dbpedia:City, http://schema.org/City, http://schema.org/Place.
foaf:homepage	http://state.mo.us/, http://www.mo.gov/, http://www.state.mo.us
skos:inScheme	http://data.nytimes.com/elements/nytd_geo
skos:prefLabel	Missouri, Missouri@en
skos:altLabel	Missouri, Missouri@en, Show-Me State@en, State of Missouri@en
skos:isSubjectOf	dbpedia:Joel_Rosenberg_(science_fiction_author)
dc:type	gn:A, gn:A.ADM1
dc-term:type	gn:A, gn:A.ADM1
dbp-ont:areaCode	573@en

# OWLIM 5.0 and SPARQL 1.1

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## Exemplary queries :

### GROUP BY, min

- Minimal and maximal population counts of European countries

### Federated Query between FactForge and LinkedLifeData

- Drugs that cure the disease from which died Alexandre Graham Bell

### Literal index over dates

- World governors in office between 1980 and 2005

### Literal index over digits

- European countries with population above 20 MLN

### Geospatial index

- Show the distance from London of airports located at most 50 miles away from it

# Challenges and usage

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- Clean data
  - Clean up input data
- At model level
  - Contradiction detection
  - Consistency checking
- Curation and upgrading methodology

FactForge has been used as data layer infrastructure in FP7 projects, like RENDER  
FactForge has been used in tasks of  
linked data generation from unstructured data,  
metadata enrichment of structured data  
providing linkages to the entire LOD cloud  
for example The National Archive

# Acknowledgements

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Partial funding



Colleagues

Atanas Kiryakov, CEO of Ontotext

Zdravko Tashev, Ontotext

Ivan Peikov, Ontotext

Rouslan Velkov, Ontotext

Kiril Simov, Ontotext

Barry Bishop, Ontotext

Barry Norton, Ontotext

Marin Dimitrov, Ontotext

Alex Simov, Ontotext

Jordan Dichev, Ontotext

Konstantin Penchev, Ontotext

Links

<http://ff-dev.ontotext.com>

<http://www.ontotext.com/owlim>

<http://www.ontotext.com/factforge>

Email:

[info@factforge.net](mailto:info@factforge.net)

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Thank you for your attention!

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