OWLIM **Cluster**
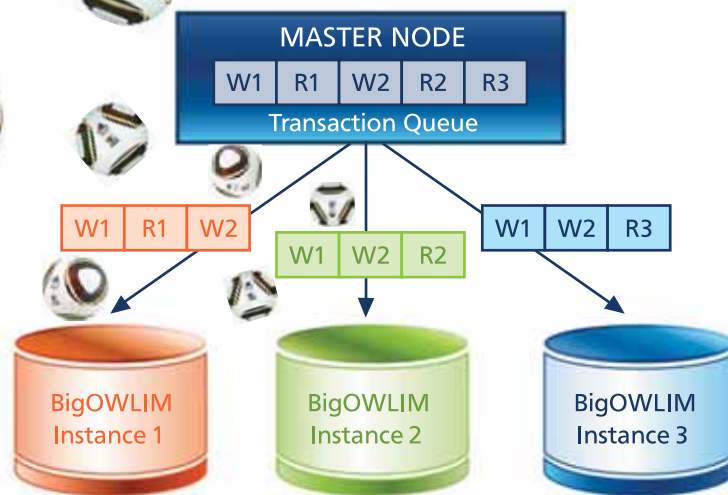## is in use at the
BBC's 2010 World Cup Website

BigOWLIM Replication Cluster
allows **load balancing,** online
re-configuration and **failover**

MASTER NODE

W1	R1	W2	R2	R3

Transaction Queue

W1	R1	W2

W1	W2	R2

W1	W2	R3

BigOWLIM
Instance 1

BigOWLIM
Instance 2

BigOWLIM
Instance 3

The **BigOWLIM** repository has been **successfully integrated**
into the high performance **Semantic Web publishing stack**
powering the BBC's 2010 World Cup site,
performing **OWL reasoning** with
continuously **changing data** and handling
millions of page requests per day

ontotext

http://www.ontotext.com/owlim
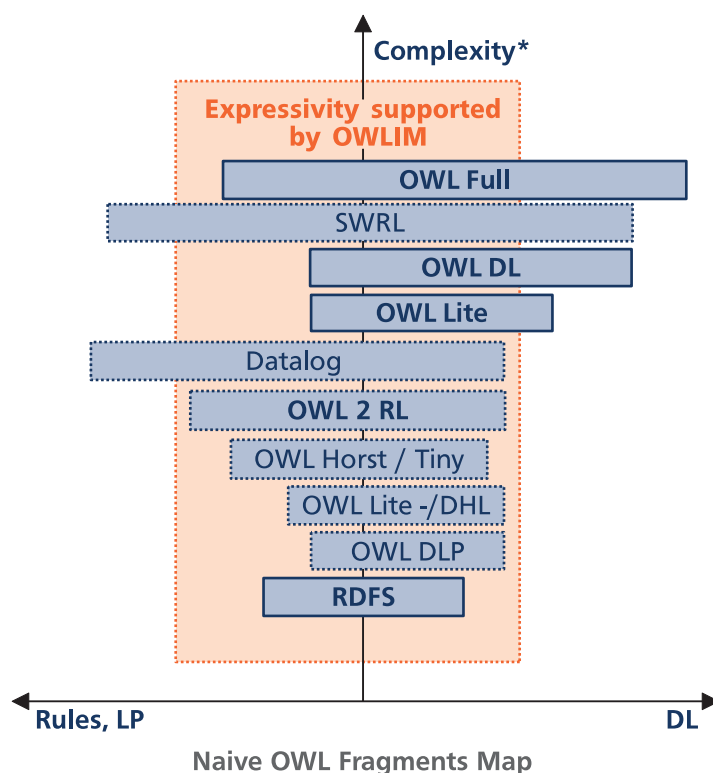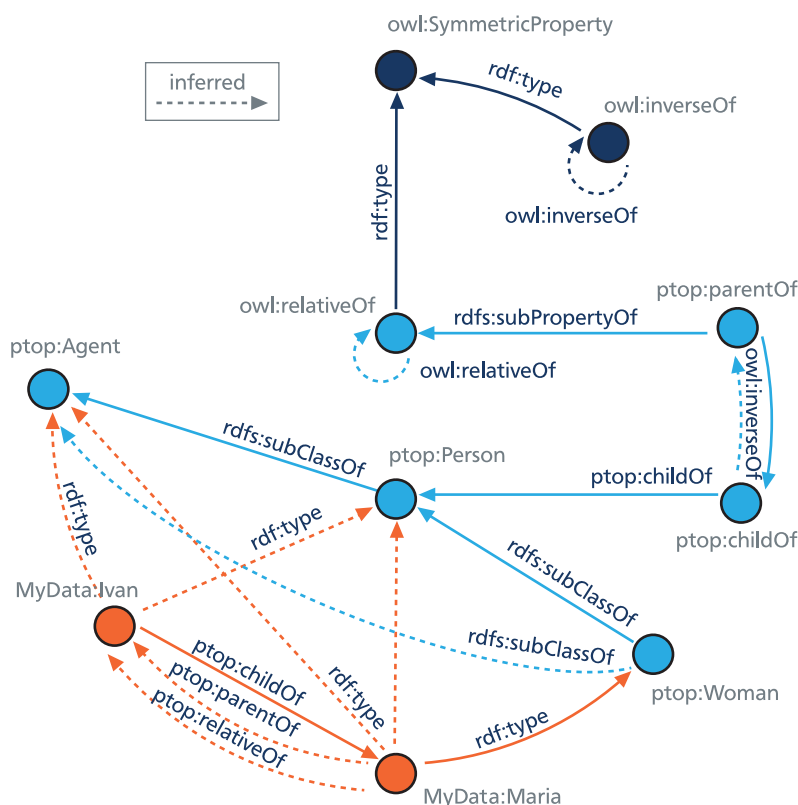
OWLIM

SEMANTIC REPOSITORIES

Semantic repositories or **semantic databases** are DBMS – their main function is to store and query structured data. The essential difference from relational DBMS is that semantic repositories can infer non–explicit facts using:

- **more expressive schema** definitions (ontologies), encoding some of the semantics of the data
- inference mechanisms to **interpret stored data**

MORE INTELLIGENT QUERY ANSWERING

Semantic repositories offer greater analytical power. A query can match criteria and return results based on data that differs from the query patterns, but bears relevant meaning.

For instance, a query pattern **"Maria, relativeOf, ?x"** can return Ivan as a match based only on the assertion **"Ivan, child-of, Maria"** (see the graph below).

Naive OWL Fragments Map

OWLIM IS AN EFFICIENT RDF DATABASE

OWLIM is a mature, native RDF semantic repository. Its performance, efficiency and robustness allow it to replace legacy DBMS in a very wide range of applications.

OWLIM is particularly suitable for:
- **Analytical tasks** and Business Intelligence
- Integration of **heterogeneous and sparse data**

OWLIM IS ALSO AN INFERENCE ENGINE

It uses rule-ba sed reason ing to support:
- RDFS, OWL Horst and OWL 2 RL
- Custom semantics via rules and axiomatic triples

http://www.ontotext.com/owlim

is a Robust Semanitc Repository

SEMANTIC DATA INTEGRATION

Semantic repositories provide an ideal platform for dataintegration because RDF is designed for the management of data created without centralized control:

- New data sources can be adopted with little effort
- Schema changes are easy to accommodate

RDF REPRESENTS A GENERIC DATA MODEL

- the logical structure of data is not fixed in its physical representation
- structure and semantics are interpreted, based on RDFS schemata and OWL ontologies

The diagram below illustrates the differences between data representation in a sample relational database model (on the right) and the corresponding RDF model (on the left).

OWLIM IN USE

BIGOWLIM IN LIFE SCIENCES
Integration of large-scale KB in the LinkedLifeData platform, consolidating biomedical databases
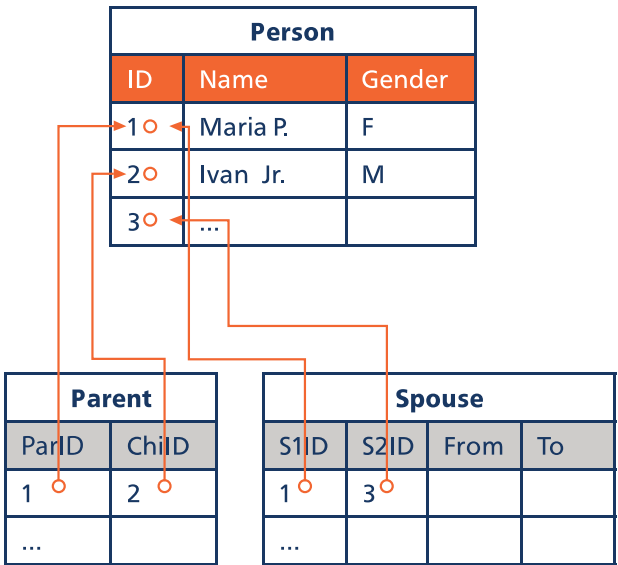
BUNDLED IN GATE AS AN ONTOLOGY SERVICE
GATE is the most popular text mining platform

INTEGRATED IN PROFIUM METADATA SERVER
BigOWLIM is integrated in Profium Metadata Server, which is heavily used for content delivery in the publishing industry

IN KIM PLATFORM AS A SEMANTIC REPOSITORY
KIM is a semantic annotation and search platform

IN TOPBRAID COMPOSER AS A REASONER
TBC is one of the most advanced RDF/OWL editors

THE DATA LAYER OF THE LARKC PROJECT
LarKC is probably the most ambitiuous large-scale reasoning project, http://www.larkc.eu/

Statement

Subject	Predicate	Object
myo:Person	rdf:type	rdfs:Class
myo:gender	rdfs:type	rdfs:Property
myo:parent	rdfs:range	myo:Person
myo:spouse	rdfs:range	myo:Person
myd:Maria	rdf:type	myo:Person
myd:Maria	rdf:label	"Maria P."
myd:Maria	myo:gender	"F"
myd:Maria	rdf:label	"Ivan Jr."
myd:Ivan	myo:gender	"M"
myd:Maria	myo:parent	Myd:Ivan
myd:Maria	myo:spouse	myd:John

Person

ID	Name	Gender
1	Maria P.	F
2	Ivan Jr.	M
3	...	

Parent

ParID	ChiID
1	2
...	

Spouse

S1ID	S2ID	From	To
1	3		
...			

ontotext

http://www.ontotext.com/owlim

BigOWLIM 3.3 Released

Proven to Handle **Millions of Queries** per Day in Critical Applications,
Supports **OWL 2 RL** Reasoning and Provides Unmatched
Linked Data Integration, Management and Retrieval Capabilities

Based on published results and independent evaluations BigOWLIM is:

- The **most scalable** semantic repository in the world [1]
- The **most efficient** semantic repository in the World [2,3], in terms of speed
  with which it can load, do inferencing, and query the data
- The repository offering the **most comprehensive reasoning** support [3,4].
  It supports RDFS, OWL-Horst, and **OWL 2 RL** and custom rule-sets. BigOWLIM
  is the only repository which provides comprehensive OWL 2 RL support today [5]

Any combination of 3 of the following features put BigOWLIM **outside competition**:

- Pure **Java implementation** and fully compatible with **Sesame 2**, which brings
  interoperability benefits and support for all popular RDF syntaxes and query
  languages, including **SPARQL**
- **Clustering support** brings resilience, failover and horizontally scalable
  parallel query processing
- **Optimized owl:sameAs** handling, which delivers dramatic improvements in
  performance and usability when huge volumes of data from multiple sources
  are integrated
- **Full-text search**, based on either Lucene or proprietary techniques
- **High performance retraction** of statements and their inferences
- Powerful and expressive **consistency checking** mechanisms
- **RDF rank**, similar to Google's PageRank, can be calculated for the nodes in
  an RDF graph and used for ordering query results by relevance
- **Notification** mechanism, to allow clients to react to updates in the data

Notes

[1] **Large Triple Stores.** Wiki page supported by W3C. http://esw.w3.org/LargeTripleStores

[2] **BSBM Results for Virtuoso, Jena TDB, BigOWLIM** (November 2009). Bizer, Ch., Schultz, A.
   http://www4.wiwiss.fu-berlin.de/bizer/BerlinSPARQLBenchmark/results/V5/index.html

[3] ¨In our tests, BigOWLIM provides the best average query response time and answers maximum number of queries   for both the
   datasets. ... it is clear to see that execution speed-wise BigOWLIM outperforms Allegrograph and Sesame for almost all of the dataset
   queries." - Thakker , D., Osman, T., Gohil, S., Lakin, P. (Press Association and the Nottingham Trent University).
   A Pragmatic Approach to Semantic Repositories Benchmarking. In Proc. of the 7th Extended Semantic Web Conference, ESWC 2010

[4] Stoilos G., Grau B. C., Horrocks I. **How Incomplete is your Semantic Web Reasoner?**
   In Proc. of the 20th Nat. Conf. on Artificial Intelligence (AAAI 10), 2010. To appear.

[5] **Implementations – OWL.** http://www.w3.org/2007/OWL/wiki/Implementations

http://www.ontotext.com/owlim