OWL Semantic Repository

Fact Sheet

OWLIM is a high-performance semantic repository, implemented in Java and packaged as a Storage and Inference Layer (SAIL) for the Sesame RDF database. OWLIM is based on TRREE – a native RDF rule-entailment engine. The supported semantics can be configured through rule-set definition and selection. The most expressive pre-defined rule-set combines unconstrained RDFS and OWL Lite. Custom rule-sets allow tuning for optimal performance and expressivity.

In SwiftOWLIM reasoning and query evaluation are performed in-memory. Still, a reliable persistence strategy assures data preservation, consistency, and integrity. A principle limitation of OWLIM is the relatively slow delete operation. Upload, reasoning, and query evaluation proceed extremely fast even against huge ontologies and knowledge bases.

OWLIM can manage millions of explicit statements on desktop hardware. According to the public evaluation data, SwiftOWLIM is the fastest OWL repository currently available.

- Web site: http://www.ontotext.com/owlim (mailing lists, documentation, presentations)
- Download: http://www.ontotext.com/owlim/v2.9.1/owlim-2.9.1.zip

Release Notes, version 2.9.1

- **1000-properties fix**: an internal limitation of TRREE for handling up to 1000 unique properties was removed.
- **Enhancement allows usage of custom rule-sets under OSGI:** two JVM properties (`Dtrree.jar.file` and `Dopenrdf-model.jar.file`) are now considered to allow for usage of custom rule-sets in environments which use custom class-loader schemes, e.g. the OSGI frameworks.
- **Minor extensions of the OWL support**: rules and axioms added to rule-set `owl-maxRules_builtin.pie` to support the reflexivity of `owl:sameAs` and the fact that all OWL classes are sub-classes of `owl:Thing` and their instances are `owl:Thing`-s.
- **Minor fix in the owl-max rule-set:** an incorrect rule was causing significant degradation in performance for some datasets when the `partialRDFS` parameter is set to `false`.
- **partialRDFS versions of the rule-set files discarded**: in previous versions, there was a pair of rule-set files for each of the predefined rule-sets, except `empty` – one version with `partialRDF` optimizations and one without them. The versions with the optimizations are now excluded because they can be derived automatically, following the behavior of TRREE's rule compiler which is duly documented.
- **Sesame 1.2.7** bundled in the release.

Interfaces, Standards, Requirements

- Nature: Java library without user interface. Sesame's Web UI can be used.
- Interfaces (API, Web Services): Java API, RMI. OWLIM implements the SAIL interfaces of Sesame.
- Platform: JDK v.1.4.2 - 1.6 (both 32-bit and 64-bit versions).

Supported standards: OWLIM is bound to the data and query standards supported by Sesame. RDF is the basic data standard; the supported query languages are: SeRQL, RQL, RDQL.

- *Syntaxes:* SwiftOWLIM uses N-Triples RDF syntax for persistence. The import and export of all major RDF syntaxes (XML, N3, N-Triples) is supported through Sesame.
- *Semantics:* OWLIM supports RDFS, OWL DLP, OWL Horst (an OWL dialect more expressive than DLP and backward compatible with RDFS), and most of OWL Lite.

Required Libraries:

- Sesame (http://www.openrdf.org) is an open-source RDF database with a support for RDF inference and querying. OWLIM is a SAIL that implements the **`RDFSchemaRepository`** interface. OWLIM v2.9.1 was tested with Sesame releases 1.2.1-1.2.7.
- TRREE (http://www.ontotext.com/trree/) is a Triple Reasoning and Rule Entailment Engine, which allows forward-chaining and materialization with respect to entailment rules. Within OWLIM, TRREE v2.9.1 comes preconfigured with several distinct sets of rules. The release also includes an internal rule compiler allowing usage of custom rule-sets for inference.

Licensing

SwiftOWLIM License Agreement:

135 Tsarigradsko Shosse, Sofia 1784, Bulgaria, http://www.ontotext.com.

SwiftOWLIM is a free software, available under. One can redistribute and/or modify it under the terms of the GNU Lesser General Public License (LGPL) version 2.1.

Licensing of Third Party Libraries:

- Sesame - (c) Copyright Aduna b.v. Sesame is an open-source library, available under LGPL.
- TRREE – (c) Copyright Ontotext Lab, Sirma Group Corp. TRREE is not an open-source software. It is owned by Ontotext Lab. SwiftTRREE v2.9.1 is licensed for use free of charge as an integral part of SwiftOWLIM v2.9.1. Re-distribution of TRREE in any form, except as part of the original SwiftOWLIM distribution package, is strictly forbidden. Any form of modification or reverse-engineering of TRREE is forbidden. SwiftTRREE is distributed together with SwiftOWLIM without any warranty.

Full licensing information is available at http://www.ontotext.com/owlim/licence.html, as well as in the **`licence.txt`** file in the main folder in the distribution package.

Installation and Usage

OWLIM is distributed as a ZIP archive that contains the **`owlim-2.9.1.jar`** and **`trree-2.9.1.jar`**, all the required libraries, configuration files, sources, documentation, and sample code and data. OWLIM is designed to be used as a Storage and Inference Layer (SAIL) of Sesame – no OWLIM specific interfaces exist. Sesame 1.2.7 libraries are included as part of the OWLIM distribution; complete Sesame distribution can be downloaded from http://www.openrdf.org. The usage of the rule-compiler (i.e. custom rule-sets) requires **`tools.jar`** from the JDK.

Future Plans

- Sesame 2.0 integration and SPARQL support and integration with the second integration of the ORDI framework (http://www.ontotext.com/ordi/).

Credits

OWLIM benefits from the scalable architecture and numerous "basic" components of Sesame.

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