



# DIP D2.5: YARS Ontology Repository

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## Document Information

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|                                     |   |
|-------------------------------------|---|
| <b>Abstract (for dissemination)</b> | This fact sheet describes the YARS ontology repository prototype. YARS is a high-performance, 100% pure Java ontology repository based on <a href="#">RDF</a> with a link to <a href="#">ORDI</a> . |
| <b>Keywords</b>                     | Ontology repository   |

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## Table of contents

### [1. Availability and Contacts](#)

### [2. Purpose and Functionality](#)

### [3. Requirements](#)

### [4. Licensing](#)

[4.1. YARS License Agreement](#)

[4.2. Licensing of Third Party Libraries](#)

### [5. Installation and Usage](#)

[5.1. Download](#)

[5.2. Installation of YARS Web Application](#)

[5.3. N3 Usage Example](#)

[5.4. ORDI Usage Example](#)

### [6. Conclusion](#)

### [References](#)

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# 1 Availability and Contacts

**Version:** 0.3, 30 June 2006.

#### **Download:**

- [Java archive \(jar\)](#) for inclusion in own applications
- [Web application archive \(war\)](#) for deployment in J2EE servlet container

**Source control:** Available from Subversion at <http://sw.deri.org/svn/sw/2004/06/yars/>.

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# 2 Purpose and Functionality

YARS [[YARS](#)] is a data store for RDF in Java. YARS uses [[Notation 3](#)] as a way to encode facts and queries. The current version supports tree-shaped datalog queries with one shared variable. Please note that YARS is intended for storage and retrieval of RDF, which offers a somewhat higher abstraction layer than the APIs of RDF toolkits such as [Jena](#) or [Redland](#). The interface for interacting with YARS is HTTP (GET, PUT, and DELETE) and built upon the REST (Representational State Transfer) principle [[REST](#)]. Much more information can be found on the [YARS homepage](#).

The current version 0.3 of YARS is a release which is fully functional with a stable access interface via HTTP. Queries can be posed using any web browser by pointing your browser to the URL of the web application in your servlet container.

Please note that in the context of WP2, there is no stand-alone user interface available, since the repository functionality is transparent to the user of any user interface that builds upon ORDI. YARS can be plugged in as an ORDI storage back-end implementation if an application programmer using ORDI wishes to do so. The [Installation and Usage](#) section explains how to use YARS as a back-end storage system from within Java.

# 3 Requirements

**Nature:** A Web application for use in Servlet containers.

**Interfaces (API, Web Services):** a HTTP REST interface.

**Platform:** JDK 1.4.2.

**Supported standards:**

- YARS supports Notation3 which is a syntax for RDF. Notation3 is a syntax widely supported by RDF systems such as [Sesame](#), [Jena2](#), [cwm](#), and [Redland](#).
- The access interface to YARS is HTTP which is the foundation of the Web.

**Required Libraries ([OMWG](#), [SDK Cluster](#), [WSMO-related](#)):**

(for using the ORDI link)

- [wsmlparser-20060210.jar](#)
- [wsmo-api-0.5.2.jar](#)
- [wsmo4j-0.5.2.jar](#)
- [ordiapi-0.4.jar](#)
- [ordiimpl-0.4.jar](#)

**Required Libraries (others):**

Included in the web application archive, separately available in SVN repository or on the respective websites.

- [Berkeley DB Java Edition](#)
- [Apache Lucene](#)

If you wish to include YARS as a stand-alone library, make sure to include `yars.jar`, `yars-api.jar` and both BerkeleyDB and Lucene libraries in your classpath.

## 4 Licensing

YARS is released under a BSD-style license.

### 4.1 YARS License Agreement

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### 4.2 Licensing of Third Party Libraries

Licensing of third party libraries and components required for ORDI:

- [BerkeleyDB](#) - BerkeleyDB Java edition is available under [an open-source license](#).
- [Apache Lucene](#) - Lucene is available under [an open-source license](#).

## 5 Installation and Usage

In the following, we describe installation of YARS, plus usage example for the N3/HTTP interface and the WSML/ORDI interface.

## 5.1 Download

All source code including third-party libraries is available in the [DOME CVS](#) with modulename yordi. We also provide a current snapshot ([yordi-20060630.tar.gz](#)) of the contents for download.

## 5.2 Installation of YARS Web Application

YARS is distributed as a web application (war) archive for deployment in a servlet container such as [Apache Tomcat](#) or [Jetty](#). To deploy, copy the yars.war file to the web applications directory of the servlet container and restart the servlet container.

## 5.3 N3 Usage Example

In the following, we describe how to interact with YARS using RDF/N3 files. For this purpose we provide a command-line client.

```
lib$ java -jar yars-api-0.3.jar
USAGE java -jar yars-api.jar [-p|-g|-d] [-q] -u <baseuri> -c <context> <file1> <file2> ... <fileN>
  -p put (upload) data (--put)
  -g get (query) (--get)
  -d delete (remove) (--delete)
  -q quiet (--quiet)
  -u baseuri of yars instance (--baseuri)
  -c context (--context)
  -h this help (--help)
  <file1>...<fileN> Notation3 files
```

Assuming a simple N3 file hello.n3:

```
@prefix ex: <http://example.org/> .
ex:subject ex:predicate "hello world" .
```

You can upload the contents of that file to YARS using the following command:

```
$ java -jar yars-api-0.3.jar -p -u http://localhost/yars/ -c world hello.n3
Sending data...done in 231 ms.
$
```

Point your web browser to <http://localhost/yars/world> to retrieve the content of the file you have uploaded. Posing queries and deleting data works analogously.

## 5.4 ORDI Usage Example

In the following, we give a step-by-step description on how to set up YARS in conjunction with ORDI. We illustrate the process with an example included in the ORDI distribution. The `StoreOntologyExample` loads a WSML ontology in human-readable syntax, converts the ontology to WSML/RDF, and saves the ontology in an RDF repository.

Using YARS as ORDI repository backend requires the following adjustments in your already existing ORDI code. We adapted the `ordixamples.StoreOntologyExample` example from the ORDI distribution by doing the following:

- Tell ORDI to use YARS as triplestore implementation:  
`createParams.put(TripleRepository.TRIPLESTORE_PROVIDER_CLASS, "org.derj.yordi.YARSTripleStore");`
- Specify the YARS instance you want to use: `createParams.put(YARSTripleStore.YARS_URI, "http://localhost:8180/yars/");`

To compile and run the `ordixamples.StoreOntologyExample` with ORDI/YARS:

1. [Download the YORDI package](#)
2. [Install the YARS web application](#) (you find `yars-0.3.war` in the `lib/` directory)
3. Add all jars in `lib/` to the classpath (part of the package are `.classpath` and `.project` files for the [Eclipse IDE](#))
4. Compile `src/org.derj.yordi` classes and `test/org.derj.yordi` test cases
5. Run the `StoreOntologyTest` test case
6. Point your browser to <http://localhost/yars/context> to see the RDF representation of the stored WSML file

## 6 Conclusion

We have described the YARS ontology repository prototype in this document. YARS is a high-performance,

100% pure Java ontology repository based on RDF with a link to ORDI.

## References

**[Notation3]** Tim Berners-Lee: *An RDF language for the Semantic Web*  
<http://www.w3.org/DesignIssues/Notation3.html>

**[YARS]** Andreas Harth, Stefan Decker: *Optimized Index Structures for Querying RDF from the Web*, 3rd Latin American Web Congress, Buenos Aires, Argentina, October 31 to November 2, 2005, pp. 71-80.  
<http://sw.deri.org/2005/02/dexa/yars.pdf>

**[REST]** Roy Thomas Fielding: *Architectural Styles and the Design of Network-based Software Architectures*, Ph.D. Thesis, University of California, Irvine, 2000.  
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