RDF and Topic Maps Interoperability in Practice

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1 Introduction

This demo will show a practical approach to interoperability between RDF and Topic Maps, based on the RTM vocabulary for mapping RDF data to Topic Maps. The demo will use the freely downloadable (registration required) Omnigator topic map browser. We will take an RDF file containing RDF data in the FOAF vocabulary [6] and show how this can be converted to a topic map, then browse the topic map to see how it is structured, and finally convert it back to RDF. We will also allow users to bring their own RDF data, which we will attempt to convert to topic maps using the same approach.

1.1 The benefits of interoperability

Topic Maps and RDF are both emerging standards that already have considerable user communities. In the case of Topic Maps a substantial number of commercial projects are already in production, and more are constantly being added. The authors are not aware of the situation for RDF, but assume it is similar.

For the users of these standards part of the reason for choosing a standard is to be able to interoperate with others, and if information cannot easily be converted between Topic Maps and RDF, users of knowledge technologies will be divided into two disparate camps, and interoperability will inevitably suffer.

Also, to realize the vision of the Semantic Web, it is crucial that users of other knowledge technologies than RDF should be able to communicate with the Semantic Web.

This demo aims to demonstrate one approach to Topic Maps/RDF interoperability that the authors believe makes it possible to use the same vocabularies (or ontologies) in both Topic Maps and RDF, and to effortlessly convert data back and forth once the mappings have been established for each vocabulary (or ontology).

We believe that this represents a significant step forwards for Topic Maps/RDF interoperability, with considerable benefits for users and for the realization of the vision of the Semantic Web.

2   The RTM vocabulary

The RTM vocabulary used to map RDF data to Topic Maps was developed based on the assumption that a generic RDF-to-Topic Maps conversion is not possible. The RTM vocabulary instead operates on the level of the individual ontology, requiring each ontology to declare how it maps to Topic Maps.

Put simply, conversions using RTM work by examining one triple at a time. If the property of the triple has an rtm:maps-to property it will be mapped; otherwise it will be ignored. If it is mapped, a topic is created representing the subject of the triple (unless one has been created for a previous triple). The value of the rtm:maps-to property will then determine whether the triple creates a base name, an occurrence, or an association.

A full description of the vocabulary and its workings are given in [4]. Background and design rationale for the vocabulary can be found in [3].

3   The demonstration

We will start with a blank Omnigator installation and copy the RDF file into it. We will then show how this can be loaded into the Omnigator by setting up the mapping using the user interface provided for this purpose by the Omnigator. The user interface presents one drop-down selection box for each property in the RDF file and lets the user choose a mapping for each property. The Omnigator will also propose mappings based on simple heuristics.

Once the mapping has been configured we will show the resulting topic map using the Omnigator to show what the result of the mapping is. We will also demonstrate how topic map tools like the tolog query language and the Vizigator graphic visualizastion tool can be used with what was originally RDF data.

Finally, we will show how topic map data can be converted to RDF data by merging a topic map using an overlapping ontology into the imported RDF data, and then exporting the result back to RDF.

4   The software

The Omnigator [1] is a freely downloadable (registration required) generic topic map browser, which can be used to view any topic map, and which also supports RDF import and export. It is based on the Ontopia Knowledge Suite (OKS), which is a commercial suite of topic map-based tools. The OKS is written entirely in Java, and supports two forms of topic map storage: as an in-memory object structure or in an RDBMS using JDBC.

An open source implementation of the RTM vocabulary is currently being developed as part of the tmapi-utils project [5], which is based on the de facto standard topic map engine API TMAPI [2]. This will not be demonstrated unless specifically requested, since it has no user interface for setting up mappings or for viewing the results.

References

[1] Ontopia AS. Omnigator. Software. 2

[2] Ahmed et al. TMAPI. Software. 3

[3] L. M. Garshol. Living with Topic Maps and RDF. 2003. 2

[4] L. M. Garshol. The RTM RDF to topic maps mapping – Definition and introduction. Technical report, Ontopia, Dec 2003. 2

[5] S. Lischke.; L. M. Garshol. tmapi-utils. Software. 3

[6] D. Brickley; L. Miller. FOAF vocabulary specification. 1