Final Report, T-Rex exchange between UIBK and NUIG

Rubén Lara and Christoph Bussler

October 27, 2004

1 Duration and Aims

Web Services promise a new level of functionality on top of the current Web. However, current Web Service technologies only provide syntactical descriptions of Web Services and, therefore, they are not amenable to automation. The efforts of WSMO[1] aim at describing Web Services and their related aspects with well-defined, formal semantics, thus providing a basis for the automatization of various tasks in the Web Service usage process.

During the exchange with NUIG, which has taken place from July 22nd to September 30th 2004, we have focused on the exploitation of semantic descriptions of Web Services and user goals to automatically discover i.e. locate Web Services that can fulfill a given goal. We have investigated a logical framework which, based on the WSMO conceptual model, provides such functionality. In addition, we have further investigated the distinction of capabilities and constraints in the Web Service context and their role in WSMO.

2 Achievements

The work done during the exchange has the following major results:

- A logical framework for automatic Web Service discovery based on Transaction Logic [2] has been defined, and it has been implemented in FLORA-2[2]. This work has been done in strong cooperation with Prof. Michael Kifer, from University at Stony Brook, as the exchange overlapped with his visit to NUIG. The framework has been published at the Semantic Web Services workshop at ISWC 2004 (see [4]). In addition, there is ongoing work to publish an extended version of this paper on the Journal of Web Semantics, Special Issue on Rules for the Semantic Web[3].

[1] http://www.wsmo.org/
[2] http://flora.sourceforge.net
[3] http://websemantics.ruleml.org/

- A complete conceptual model for service discovery in WSMO has been started during the exchange and finished right after it. This work is already available as a WSML[4] deliverable [3]. This work will be submitted to the European Semantic Web Conference (ESWC 2005)[5].

- An implementation of a discovery engine based on the previously mentioned work is in progress. This discovery engine will be integrated in the WSMX[6] execution platform, mainly developed at NUIG. This work will benefit from the contact established with researchers at NUIG and will rely on a close cooperation with them.

- The role of constraints and capabilities in Web Services and, in particular, in WSMO, has been jointly investigated with researchers from NUIG. As a result, a joint position paper [1] has been accepted at the W3C workshop on constraints and capabilities[7] and already presented there.

- Most of the afore-mentioned work has been oriented towards the achievement of the results promised as part of the Knowledge Web deliverable 2.4.2 on Web Service Discovery and Composition. The results achieved during the exchange at NUIG and the effective cooperation that has continued afterwards constitute the core of the content on Web Service discovery of this deliverable, due to December 31st, 2004.

As a summary, the exchange has been fruitful and has already resulted in joint publications. Furthermore, the cooperation with NUIG is being continued after the exchange, and two additional publications and a discovery engine for WSMO to be integrated with WSMX are already in progress.

References

[1] Sinuhe Arroyo, Christoph Bussler, Jacek Kopecky, Ruben Lara, Axel Polleres, and Michal Zaremba. Web service capabilities and constraints in wsmo. In *W3C Workshop on Constraints and Capabilities for Web Services*, October 2004.

[2] A.J. Bonner and M. Kifer. A logic for programming database transactions. In J. Chomicki and G. Saake, editors, *Logics for Databases and Information Systems*, chapter 5, pages 117–166. Kluwer Academic Publishers, March 1998.

[3] Uwe Keller, Ruben Lara, Axel Polleres, Ioan Toma, Michael Kifer, and Dieter Fensel. Wsmo discovery. Technical report, WSML Working Draft D5.1, October 2004.

[4] http://www.wsmo.org/wsml/
[5] http://www.eswc2005.org/
[6] http://www.wsmx.org/
[7] http://www.w3.org/2004/06/ws-cc-cfp.html

[4] Michael Kifer, Ruben Lara, Axel Polleres, Chang Zhao, Uwe Keller, and Holger Lausen. A logical framework for web service discovery. In *Workshop on Semantic Web Services, ISWC 2004*, November 2004.