Enhancing Web Service Descriptions using WSDL-S

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Introduction

Web Services offer an ideal solution for integrating heterogeneous, distributed applications on a Web scale. The collection of XML based standards, which make up the infrastructure of Web Services, makes this possible. Providing automation to discover and execute these services increases their potential multi-fold, thereby enabling their use in dynamic business processes. Semantic Web Services provide machine processable, interpretable information about service descriptions and service functionality. This additional information helps in realizing automation of Web Services. This presentation will discuss the METEOR-S [1] project, which deals with adding semantics to the complete lifecycle of Web processes. The distinguishing factor of METEOR-S is that, unlike alternate approaches like OWL-S [2] and WSMO [3], our focus is on creating a framework for semantic Web services and processes that is fully aligned with the current standards [4]. We endeavor to achieve a greater impact of our research by providing prototypes for our tools using the eclipse platform. In this presentation, we will focus on the METEOR-S Semantic Web Services Development Tool, which has been developed as an eclipse plug-in. We will also describe, WSDL-S [5] which is an extension of WSDL with semantic enhancements.
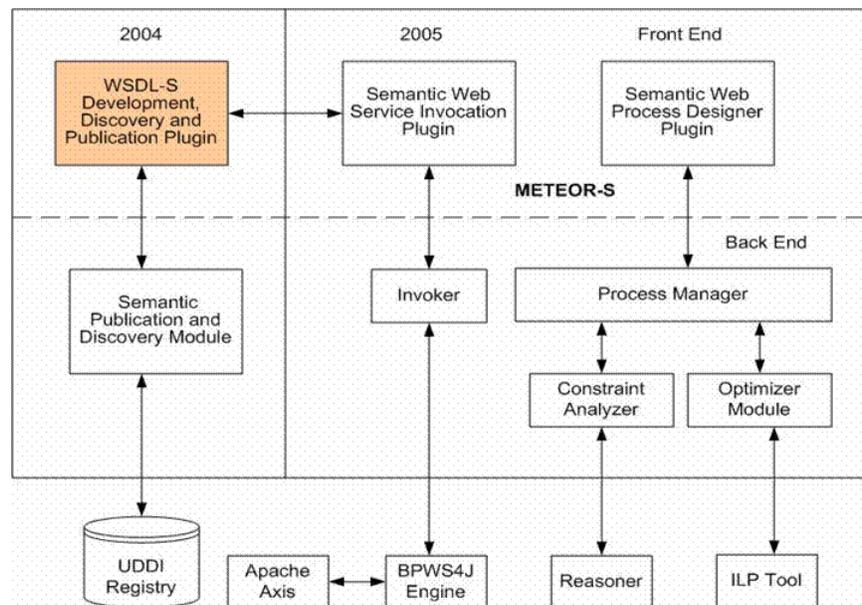

Figure 1. METEOR-S Architecture

The METEOR-S architecture and relationship with the eclipse platform is shown in Figure 1. In this presentation, while we will focus on the WSDL-S plug-in (shown in color), we will also discuss the use of eclipse in supporting the complete lifecycle of semantic Web processes, which includes Web services development, deployment, annotation, publication and discovery, as well as Web processes design, constraint analysis, optimization and execution. The METEOR-S project is partially supported by 2004 and 2005 Eclipse Innovation Grants.

Eclipse Based Plug-in

The METEOR-S semantic Web service development plug-in allows users to create semantic Web services from either source code (java) or already existing Web services. It supports the following features – development, deployment, annotation and Semantic publication/discovery. A snapshot of the plug-in is shown in Figure 2.
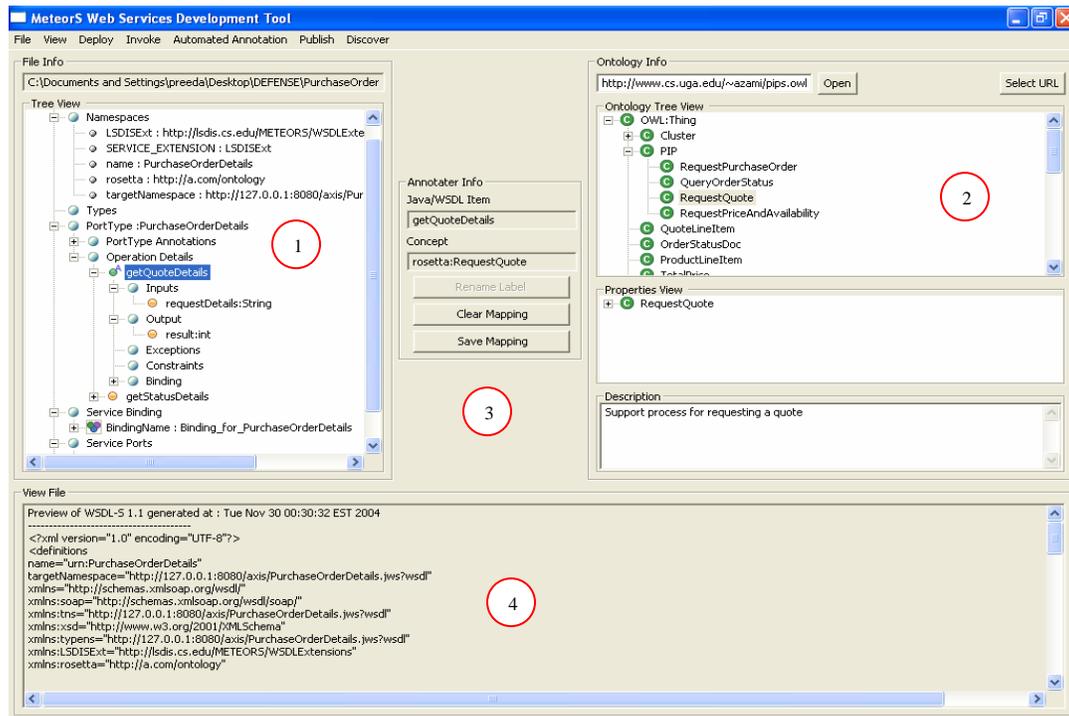

Figure 2. Snapshot of the METEOR-S Semantic Web Services Development Tool

The tool offers tree representations of the source code/WSDL files (1) and Ontology files (OWL files) (2) simultaneously to enable to the user to choose the most appropriate mapping. Moreover, the tree representations help the user to browse/navigate through the entire document in a comparatively less amount of time, without having to deal with Java Implementation Code/XML syntax representations. The 'Choose-Click-Annotate' (3) methodology helps the user to refrain from direct syntax/file manipulations. The tool essentially frees the developer from the task of representing and incorporating annotations and helps him/her focus on the task at hand, to provide the most appropriate annotations. Relevant matches are suggested using schema matching algorithms [6]. Finally the annotated file can be previewed (4). This tool is available for download at http://lsdis.cs.uga.edu/Projects/METEOR-S/Downloads/ as an eclipse plug-in. Our next step is a joint UGA-IBM submission of WSDL-S to W3C.

REFERENCES (complete list available at http://lsdis.cs.uga.edu/Projects/METEOR-S/)
[1] METEOR-S Project, http://lsdis.cs.uga.edu/Projects/METEOR-S/
[2] OWL-S, http://www.daml.org/services/owl-s/
[3] WSMO, http://www.wsmo.org/
[4] WSDL-S, http://lsdis.cs.uga.edu/projects/WSDL-S/wsdl-s.pdf
[5] Sivashanmugam, K., Verma, K., Sheth, A., Miller, J., Adding Semantics to Web Services Standards, Proceedings of the 1st International Conference on Web Services (ICWS'03).
[6] Abhijit Patil, Swapna Oundhakar, Amit Sheth, Kunal Verma, METEOR-S Web service Annotation Framework, The Proceedings of the Thirteenth International World Wide Web Conference