Semantic Structure Matching for Assessing Web-Service Similarity

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Abstract. The web-services stack of standards is designed to support the reuse and interoperation of software components on the web. A critical step in the process of developing applications based on web services is service discovery, i.e., the identification of existing web services that can potentially be used in the context of a new web application. UDDI, the standard API for publishing web-services specifications, provides a simple browsing-by-business-category mechanism for developers to review and select published services. To support programmatic service discovery, we have developed a suite of methods that utilizes both the semantics of the identifiers of WSDL descriptions and the structure of their operations, messages and data types to assess the similarity of two WSDL files. Given only a textual description of the desired service, a semantic information-retrieval method can be used to identify and order the most similar service-description files. This step assesses the similarity of the provided description of the desired service with the available services. If a (potentially partial) specification of the desired service behavior is also available, this set of likely candidates can be further refined by a semantic structure-matching step assessing the structural similarity of the desired vs. the retrieved services and the semantic similarity of their identifier. In this paper, we describe and experimentally evaluate our suite of service-similarity assessment methods.