Adding semantics to stateful web services

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Abstract. Web Service Resource Framework (WSRF) is a recent effort of the grid community to facilitate modeling of the stateful services. Semantic Web Services (SWS) initiative is proposing a standard called OWL-S, to help the intelligent service provisioning i.e. automated discovery, composition and invocation of the services. In this paper we provide an overview of both frameworks and analyse their complementary features. We will also describe the OWL-S extensions necessary to cover the services introduced by the WSRF standard. Analysis of the requirements as well as description of the architecture is provided. A flood-forecasting application scenario is described, which have been used to evaluate the architecture.

1 Introduction

Recently, Web service (WS) technologies are gaining importance in the implementation of the distributed systems, especially grids. One such example is the Web Service Resource Framework (WSRF) [4], which extends the current WS technologies by modeling the stateful services. Design and development of the service oriented distributed system is quite common and there are several emerging WS initiatives, which tries to automate the process of discovery, composition and invocation of services. The semantic web services are a typical example, showing the potential of how ontological modeling can improve the shortcomings of the service oriented computing.

In this paper we propose the semantic description of the stateful web services introduced by the WSRF specifications. We also describe a corresponding distributed broker based architecture for discovery and invocation of both stateful and stateless services. We provide a brief overview of the semantic web services specification (OWL-S) and show how it can be used to model the basic stateful services as described by the WSRF.