

Implementing Ontology-Based Dynamic Service Discovery in JavaSpaces

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Abstract

Web services are self-describing software components that can be advertised, located, and invoked across the Internet through standard protocols. Web services encapsulate application functionality and information resources, and are available online for the service users to utilize them dynamically. One of the challenging issues in developing a service-oriented system is to dynamically discover web services according to the system requirements from the service consumers.

In this project, we implement an ontology-based dynamic service discovery mechanism in JavaSpaces. JavaSpaces technology is a Jini service that provides a place on the network to store and share java objects. One of the major benefits of using JavaSpaces is that it allows loose coupling among these objects and has more scalability. The web services are published and discovered in JavaSpaces based on semantic information. We adopt a healthcare application to illustrate our ontology-based approach. In our application, the client side defines the knowledge of symptoms and diseases. The knowledge is specified semantically using ontology, which is written in the OWL web ontology language. The knowledge defined in the ontology can be queried in order to obtain the specific disease according to the given symptoms provided by the end-user. The disease as an output for the given symptoms is then used to discover the web services for hospital information in JavaSpaces. Finally, the web services are automatically invoked and the results are returned to the end-user.