

## A HIERARCHICAL AND CHORD-BASED SEMANTIC SERVICE DISCOVERY SYSTEM IN THE UNIVERSAL NETWORK

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**ABSTRACT.** *The service of Universal Network is distinct from that of current network in that the former has QoS (Quality of Service) grading, and as a result, service discovery in the Universal Network is also quite different from that of present network. In this paper, we present a hierarchical semantic service discovery system for the Universal Network- UniNServ. It uses OWL-S (Web ontology language for services) to describe services, and adopts Chord as a distributed lookup protocol. Besides, UniNServ uses three types of ontologies to perform automatic semantic service discovery with QoS through exploiting the logical relationships within the services. Experiments demonstrate the high performance of our Chord- based semantic service discovery system.*

**Keywords:** Universal network, Service discovery, OWL, Chord

**1. Introduction.** In the present information network, one kind of network mostly supports one kind of service. For instance, telecom network basically faces phonetic business while IP network mainly supports data business. Due to the limitation of the original model, the existing network can not satisfy diversified requirements essentially. It is very meaningful to form the Universal Network [1]. Present Internet supplies best-effort services, which can not meet users' requirements [2]. Users often ask services with specified QoS, so providing QoS grading for services is one of the most important features in the future service discovery system. The Universal Network, which combines telecom network with IP network, is under developing. Providing QoS grading for pervasive services is one significant characteristic of the Universal Network.

At present, many service discovery processes use keyword-matching technique to find published services. This method often discontents requesters with so many unrelated results that lead to certain amount of manual work to choose the proper ones [3]. In order to realize automatic discovery, many researches adopt semantic web technique-OWL-S, which is innovative for service discovery. With OWL-S markup of services, the information necessary for service discovery could be specified as computer-interpretable [4]. In order to accomplish service discovery in the Universal Network, we append QoS measurements to OWL-S, and called it OWL-QoS. Using QoS information, it can satisfy users' high-class requirements, and this was presented in our earlier-stage work [5]. In the following OWL-QoS is used to describe services.