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一种双层P2P结构的语义服务发现模型

刘志忠, 王怀民, 周 斌

刘志忠1, 王怀民1,2, 周 斌1
1(国防科学技术大学 计算机学院 网络与信息安全研究所,湖南 长沙 410073)
2(国防科学技术大学 计算机学院 并行与分布处理国家重点实验室,湖南 长沙 410073)
作者简介: 刘志忠(1980－),男,江西吉安人,博士生,主要研究领域为面向服务计算.王怀民(1962－),男,博士,教授,博士生导师,CCF高级会员,主要研究领域为分布式计算,Agent技术.周斌(1971－),男,博士,副研究员,主要研究领域为面向服务计算,软件工程.
联系人: 刘志忠 Fax: +86-731-4512504, E-mail: liuzane@gmail.com, http://www.nudt.edu.cn

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Abstract
In open Internet environment, it is inevitable that multiple ontologies coexist. Centralized service discovery mechanism becomes the bottleneck of SOC (service oriented computing), which results in poor scalability of system. Aiming at solving these problems, a two layered P2P based model for semantic service discovery is proposed in this paper. The model is based on ontology community and integrates iVCE (Internet-based virtual computing environment) core concepts into a P2P model. Based on this model, a service discovery algorithm composed of two stages and three steps is proposed. It matches services across communities as well as within community. Within a community, algorithm locates registers holding service information with a high probability of satisfying a request firstly. Then it captures semantic matching between service advertisements and service requests by logical reasoning. Service discovery across communities occurs according to some policies. The model is suitable for opening environment with coexistent multiple ontologies. Experimental results show that given an appropriate setting, the model can make a tradeoff between recall and responding time. In addition, the model will release the mean load of registers efficiently while holding recall.

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摘要
在开放的Internet环境下,多本体共存是一种必然.同时,集中式的语义服务发现机制是整个面向服务计算的瓶颈,导致系统的可扩展性差.为了支持多本体共存并提高系统的可扩展性,提出一种双层P2P语义服务发现模型.该模型以本体社区为核心,将iVCE(Internet-based virtual computing environment)的核心概念集成到P2P模型中.基于该模型,提出一种分两个阶段、3个步骤的服务发现算法.除了在本体社区内以外,算法还可以实现跨社区的服务发现.在本体社区内,算法首先根据语义相似性选定相应的注册服务器,然后再利用逻辑推理来实施精确的服务匹配.而跨社区的服务发现则按照一定的策略实施.该模型适用于多本体共存的开放环境.实验结果表明,通过合理的参数配置,模型能在查全率和服务发现响应时间之间加以折衷,并取得较好的结果;另外,模型能够在不降低服务查全率的情况下降低注册服务节点的平均负载.

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