

P.O.Box 8718, Beijing 100080, China	Journal of Software, May 2006,17(5):1170-1181
E-mail: jos@iscas.ac.cn	ISSN 1000-9825, CODEN RUXUEW, CN 11-2560/TP
http://www.jos.org.cn	Copyright © 2006 by <i>Journal of Software</i>

SemreX:一种基于语义相似度的P2P覆盖网络

陈汉华, 金海, 宁小敏, 袁平鹏, 武浩, 郭志鑫

[Full-Text PDF](#) [Submission](#) [Back](#)

陈汉华, 金海, 宁小敏, 袁平鹏, 武浩, 郭志鑫

(集群与网格计算湖北省重点实验室(华中科技大学),湖北 武汉 430074)

作者简介: 陈汉华(1978—),男,湖北武汉人,博士生,主要研究领域为网格计算,对等计算,语义Web.金海(1966—),男,博士,教授,博士生导师,CCF高级会员,主要研究领域为计算机体系结构,集群计算与网格计算,并行与分布式计算,对等计算,高性能网络存储和并行I/O,Web和网络安全,多媒体技术,移动计算,普适计算.宁小敏(1978—),男,博士生,主要研究领域为网格计算,对等计算,语义Web.袁平鹏(1972—),男,博士,副教授,主要研究领域为CSCW,网格计算,语义Web.武浩(1979—),男,博士生,主要研究领域为网格计算,对等计算,语义Web.郭志鑫(1977—),男,博士生,讲师,主要研究领域为网格计算,语义Web.

联系人: 金海 Phn: +86-27-87543529, E-mail: hjin@hust.edu.cn, <http://grid.hust.edu.cn/hjin>

Received 2005-06-15; Accepted 2005-12-16

Abstract

The decentralized structure together with the self-organization and fault-tolerant features makes P2P network an effective model for information sharing, however, the content location remains a serious challenge of large scale P2P networks. In this paper, the SemreX is introduced, which is a P2P system for literature retrieval. Semantic-similarity-based P2P overlay and routing algorithms are proposed for SemreX. Experimental results show that searching in semantic overlay greatly improves the efficiency of search.

Chen HH, Jin H, Ning XM, Yuan PP, Wu H, Guo ZX. SemreX: A semantic similarity based P2P overlay network. *Journal of Software*, 2006,17(5):1170-1181.

DOI: 10.1360/jos1711170

<http://www.jos.org.cn/1000-9825/17/1170.htm>

摘要

对等(peer-to-peer)网络的非集中结构、良好的自治性及容错性等特征,使其可能成为Internet上有效的信息共享模型.然而,内容定位问题仍然是大规模P2P网络中信息共享所面临的挑战.SemreX系统是一种P2P网络环境下的文献检索系统.针对SemreX系统,提出一种基于语义相似度的P2P拓扑管理和查询路由算法.仿真实验结果表明,语义拓扑能够有效地提高系统的搜索效率.

基金项目: 本文为2005年中国计算机大会推荐优秀论文.Supported by the National Grand Fundamental Research 973 Program of China under Grant No.2003CB317003 (国家重点基础研究发展规划(973))

References:

- [1] Shen HT, Shu Y, Yu B. Efficient semantic-based content search in P2P network. *IEEE Trans. on Knowledge and Data Engineering*, 2004,16(7):813-826.
- [2] Stoica I, Morris R, Karger D, Kaashoek MF, Balakrishnan H. Chord: A scalable peer-to-peer lookup service for Internet applications. In: Govindan, ed. *Proc. of the ACM SIGCOMM 2001*. ACM Press, 2001. 149-160.
- [3] Ratnasamy S, Francis P, Handley M, Karp R, Shenker S. A scalable content-addressable network. In: Govindan, ed. *Proc. of the ACM SIGCOMM 2001*. ACM Press, 2001. 162-172.

[4] Castro M, Costa M, Rowstron A. Debunking some myths about structured and unstructured overlays. In: Proc. of the 2nd USENIX Symp. on Networked Systems Design and Implementation (NSDI 2005). USENIX, 2005.

[5] Gkantsidis C, Mihail M, Saberi A. Random walks in peer-to-peer networks. In: Proc. of the IEEE INFOCOM 2004. New York: IEEE Press, 2004. 120-130.

[6] Broekstra J, Kampman A, Harmelen FV. Sesame: A generic architecture for storing and querying RDF and RDF schema. In: Horrocks I, Hendler JA, eds. Proc. of the ISWC 2002. Berlin: Springer-Verlag, 2002. 547-68.

[7] Milojevic DS, Kalogeraki V, Lukose R, Nagaraja K, Pruyne J, Richard B, Rollings S, Xu Z. Peer-to-Peer Computing. Palo Alto: HP Laboratories: Hewlett-Packard Company, 2002. 1-52.

[8] Budanitsky A, Hirst G. Semantic distance in WordNet: An experimental, application-oriented evaluation of five measures. In: Proc. of the Workshop on WordNet and other Lexical Resources. 2001.

[9] Rada R, Mili H, Bicknell E, Blettner M. Development and application of a metric on semantic nets. IEEE Trans. on System, Man, and Cybernetics, 1989,19(1):17-30.

[10] Yuhua L, Bandar ZA, McLean D. An approach for measuring semantic similarity between words using multiple information sources. IEEE Trans. on Knowledge and Data Engineering, 2003,15(4):871-882.

[11] Resnik P. Semantic similarity in a taxonomy: An information-based measure and its application to problems of ambiguity in natural language. Journal of Artificial Intelligence Research, 1999,11:95-130.

[12] Jiang JJ, Conrath DW. Semantic similarity based on corpus statistics and lexical taxonomy. In: Proc. of the Int'l Conf. Research on Computational Linguistics (ROCLING X). 1997.

[13] Batagelj V, Mrvar A. Pajek—Analysis and visualization of large networks. In: Mutzel P, Jünger M, Leipert S, eds. Proc. of the 9th Int'l Symp. on Graph Drawing. Berlin: Springer-Verlag, 2001. 477-478.

[14] Matei R, Lamnitchi A, Foster I. Mapping the Gnutella network. IEEE Internet Computing, 2002,6(1):50-57.

[15] Haase P, Broekstra J, Ehrig M, Menken M, Mika P, Plechawski M, Pyszlak P, Schnizler B, Siebes R, Staab S, Tempich C. Bibster?A semantic-based bibliographic peer-to-peer system. In: McIlraith SA, Plexousakis D, Harmelen FV, eds. Proc. of the ISWC 2004. Berlin: Springer-Verlag, 2004. 122-136.~42.