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基于匹配路径和概率平衡树的P2P语义路由模型

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Abstract
Semantic routing is one of key parts in P2P routing researches. The intelligent search mechanisms support flexible semantic expression but hold low scalability and recall rate. Contrastively, semantic overlay network is scalable but either is difficult to organize or take too large maintenance spending. This paper proposes a new P2P semantic routing model in which node array is organized by match path and probability balance tree, and then an approximately balance distributed structure is obtained. All nodes will take routing decision according to query content while limiting maintenance spending to relative low level. The model supports flexible semantic search and high scalability, and ensures that each node can reach any corner of the network. The model runs with no center service in which all nodes simultaneously take index storage and data storage, and forward task to share system's running load by only maintaining a little local information.

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摘要
语义路由是P2P路由技术的关键研究内容之一.智能化路由策略语义表达灵活,但可扩展性和查全率较低;语义覆盖网络可扩展性好,但要么难以组织,要么维护开销很大.提出一种新的基于匹配路径和概率平衡树的P2P语义路由模型(match path and probability balance tree,简称MPPBTree),通过层次化和匹配路径组织资源存储结构和节点排布方式,达到一种近似平衡的分布特征,使节点能够根据查询内容本身进行路由决策,并同时保持较低的维护开销.模型支持灵活的语义搜索,拥有良好的可扩展性,保证任意节点的路由都能覆盖全网络.模型不要求任何中心服务的存在,所有的节点只需维护少量局部信息,且都会同时承担索引、存储、中继的功能,以均摊系统运行的负荷.

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