Abstract

Efficient search is a challenging task in unstructured peer-to-peer networks. In this paper, Knowledge and Cache based Adaptive Query Searching (KCAQS) is proposed that adaptively performs a query searching through either directed flooding or biased random walk based on the number of hop counts in query message. In addition, knowledge intended forwarding is deployed for forwarding a query to the high quality peers through probabilistic knowledge predicted from the previously requested queries. Searched results are properly cached in the peers along the returning path. Synchronized caching is performed to properly update the responses of each peer to its connected corresponding high degree connectivity peer in the overlay network. Due to caching of the same files in many peers, most of the cached responses may become redundant. In order to avoid redundant data, cache consistency is sustained through the flexible polling mechanism where a proper cache update is performed through Additive Decrease Multiplicative Increase (ADMI) algorithm based on file utility. Our experimental study shows that the proposed searching scheme significantly reduces the network search traffic and communication overhead. Performance metrics such as success rate, access latency, network traffic response time and cache hit ratio are evaluated for the proposed scheme.


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**Index Terms**

Computer Science Networks

**Keywords**

Unstructured Peer To Peer Networks Blind Search Caching Technique Efficient Search