ABSTRACT

As the number of people access WWW increased, network congestion and server overloading occurred. Web caching has been used to alleviate this problem. However a single cache is a bottleneck and single point of failure. So caches cooperate to solve this problem and to increase the probability to hit a document. One approach to make caches cooperate is by setting up a caching hierarchy. However, the more the levels to fetch the document, the more the user access latency. That is, it may well be that obtaining an object directly from the origin server is less expensive and faster than from a distant cache.

In this thesis, a method called Latency improved caching algorithm (LICA) is proposed to improve user access latency of hierarchical caching by fetching the document from the origin server when the document is not found at the lower cache level of the hierarchy—institutional caches or regional caches.

From the experiments, the latency of the latency improved caching algorithm (LICA) is less than the latency of traditional hierarchical caching, especially when the document changes too frequently. LICA also outperform than another one in the case that the nodal outdegree of the tree or the distance of each cache level in hierarchy is large and the bandwidth capacity at institutional network is abundant for large client community.