Abstract

Caching is a popular mechanism for enhancing performance of memory access speed. To achieve such enhancement, cached data should have enough locality in time. Locality is an inseparable property of data in standalone computers, but do network traffic patterns have sufficient locality so that caches can take advantage from? Although individual IP addresses do not show significant locality, IP prefixes in a network (especially close to hosts which comprise hot documents) are dominantly repetitive and local, so caches may work based on IP prefixes instead of entire IP addresses. Considering the locality of IP prefixes, there is still another challenge which should be overcome. According to memory constraints hosts are faced with, caches can include limited proportion of information that they really need to. To acquire non-cached information, nodes have to communicate with corresponding servers which is time and resource consuming. To effectively deal with such issue networks can be enhanced with cooperative caching by which every node provides its cache contents to others when they submit requests. This paper outlines an improved cooperative caching method which functions based on IP prefixes to divide network to several partitions. Experiments indicate that the proposed mechanism would noticeably improve cache hit, cache load, and CPU load parameters.
- University of Oregon Route Views Project, http://www.antc.uoregon.edu/route-views/

Index Terms

Computer Science
Information Sciences
Keywords
  cooperative caching  IP prefix  Static and dynamic hashing