Service differentiation for collaborative caching query process in mobile database

ABSTRACT

With the dramatic explosion of the real time mobile application, mobile computing is undergoing a transition from a data communication infrastructure to a global information utility. Wireless phones, PDAs, laptop, and high-end workstation can be viewed as appliances that need to be plug-in to this utility for accessing the information. However, due to mobile limited resources, such as insufficient wireless bandwidth, disconnection and client's mobility, collaborative cache management faces vast challenges. One of these challenges is that all requests are processed in the same manner, as well as these requests are forwarded from hop to hop along the way towards the main database server while the requested data items are missed locally. However, these forward data requests might cause delay and increase the number of hops to serve the requests. This paper aims to study the resource management problem to support differentiated collaborative caching and content distribution services. We focus on the preferential of data exchange among neighbor's nodes to support priority-based caching services. Thus, the collaborative neighbors caching increased, and the cache hit within the system is increased indirectly while most of the requests are answered from the neighbor nodes collaboration instead of relying much on the main database server. The proposed model demonstrates its ability to provide quantifiable service differentiation in terms of increasing the percentage of answering the data item requests locally, with minimal efficiency penalties compared to existence collaborative caching models.

Keyword: Collaborative caching; Mobile database; Query processing