Web Prefetching Using Partial Match Prediction

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Abstract

Web traffic is now one of the major components of Internet traffic, which corresponds to the explosive growth that this medium is experiencing. One of the main directions of research in this area is to reduce the time latencies users experience when navigating through Web sites. Caching is already being used in that direction, yet, the characteristics of the Web cause caching in this medium to have poor performance. Therefore, *prefetching* is now being studied in the Web context. When prefetching is employed, Web pages that the user is likely to access in the near future are transfered without being requested. Thus, when prefetching is appropriately employed, the performance of the cache can be significantly improved, which will in turn have a direct impact on the delays perceived by the users.

This study investigates the use of partial match prediction, a technique taken from the data compression literature, for prefetching in the Web. The main concern when employing prefetching is to predict as many future requests as possible, while limiting the false predictions to a minimum. The simulation results suggest that a high fraction of the predictions are accurate, so that additional network traffic is kept low. Furthermore, the simulations show that prefetching can substantially increase cache hit rates.