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流媒体服务系统中一种基于数据预取的缓存策略

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A Prefetching-based Caching Policy in Streaming Service Systems

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摘要 具有 VCR 功能的流媒体服务系统由于请求的随机性会影响用户的点播体验，该文结合数据预取机制以及基于分段的缓存策略计算出用户点播延迟的期望，给出一个较优的缓存管理策略，并通过在线计算逼近最优解，同时在缓存已知的情况下，给出相应的数据预取算法，利用缓存和预取两种数据获取方法的相互协作减小客户端点播延迟，提高缓存效率。仿真结果证实了所提算法的有效性。

关键词：　多媒体通信　预取机制　缓存策略　服务质量

Abstract： Customers can not get high QoS from the streaming service systems with VCR operation because of the random requests. This paper derives the expectation of the demanding delay with the methods of prefetching and segment-based caching. A near-optimal policy of cache management is given, and the solution can approximate to the optimal one by computing online. The prefetching algorithm is given in the paper. The algorithm can reduce the delay of demands from clients with cooperation of caching and prefetching for improving the efficiency of cache. Simulation results show the effectiveness of proposed algorithm.

Keywords： Multimedia communication　Prefetching scheme　Caching policy　Quality of Service (QoS)

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