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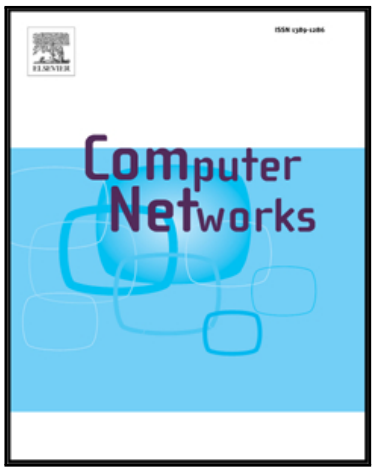

Towards the Multi-Request Mechanism in Pull-Based Peer-to-Peer Live Streaming Systems

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Towards the Multi-Request Mechanism in Pull-Based Peer-to-Peer Live Streaming Systems

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Abstract

The multi-request mechanism is widely used in pull-based peer-to-peer (P2P) live streaming systems. However, few studies have concentrated on the modeling and analysis of this mechanism. To this end, we first introduce the concept of the requesting mode and propose three multi-request streaming schemes. Then, we study the proposed schemes through analytical modeling and simulation. For analytical modeling, we propose an upper bound model to predict the streaming performance under various requesting modes. The model reveals the delicate symmetry between the pull-based schemes and the push-based schemes. For simulation, we implement the proposed schemes using two strategies to compare with the upper bound model. Finally, we evaluate the overall performance of the proposed schemes in terms of the diffusion rate and diffusion delay via extensive numerical results and simulations. We demonstrate that the proposed schemes can achieve comparable performance to that of the push-based schemes under appropriate requesting modes. In addition, the performance gap between the model and the simulation strategies shows the extent to which the realistic strategies can be improved when using the multi-request mechanism in pull-based systems.

Keywords: Peer-to-Peer (P2P), BitTorrent, Live Streaming, Pull, Request

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