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Author Cheng Yi Chi
Author's Email Address No Public.
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Abstract
In this paper, we deal with the problem of providing Video-on-Demand (VoD) service under Scheduled Video Delivery (SVD) paradigm, which allows users to request a video for instant viewing or later viewing. In this paradigm, a major concern for the server is how to schedule the delivery of requested videos to assure users a continuous playback while utilizing its limited resources efficiently. We propose a novel approach, P2MCMD, to deal with this problem. P2MCMD treats the service of video delivery in finer granularity; what is scheduled is segment-based multicast groups instead of video-based multicast groups. With the aid of dynamic multicast, the server is enabled to allocate its delivery resources flexibly and efficiently. The uneven popularity of provided videos are also taken into account and exploited so that the produced delivery schedule has the potential to boost the degree of multicast, thereby making the server achieve higher resource utilization. Moreover, peer-to-peer cooperation is employed to alleviate the workload at the server. The server can be relieved of the retransmission of duplicate video segments by enabling a latecomer to appeal to early arriving peers for the missing initial video segments. The performance of P2MCMD is evaluated through simulation. The simulation results show that our proposed approach can scale to a larger number of requests and allow the provision of a wider variety of videos at the server as compared with the existing approaches for SVD paradigm.
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