An Incentive Protocol for Distributed Dynamic P2P Video-on-Demand Streaming

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Abstract:

P2P file streaming has become very popular in on-line video sharing. Under the video on demand (VoD) setting, peers in the network may be interested in different portions of the same video. It is a new challenge to distribute the server load to peers under the VoD setting while at the same time maintaining the streaming performance, i.e., low latency and good fluency. It is also important to design incentive protocols in which peers' benefits are not compromised too much when they behave unselfishly by disseminating their neighbors' downloading requests.

In this paper, we describe and discuss a stochastic large-scale P2P VoD system in which each peer has constant number of out-neighbors and only communicate with one other peer in one round. We assume the video to be streamed is divided into M consecutive chunks and only one chunk will be transmitted due to network bandwidth every communication. We decentralize the whole system such that each peer has no extra information about the network or how other peers behave, and can only communicate with its own neighbors independently without the help of tracker to obtain robustness. Moreover, the model we consider is fully dynamic: peers leave and join the network frequently.

We also prove some interesting properties of our protocol and show by experiment that even under the bounded connection, bounded transmission and distributed setting, our protocol ensures that almost all peers in the dynamic P2P VoD network can achieve low latency and good fluency in different kinds of network topologies. We also analyze the streaming performance when peers behave differently (selfish vs. unselfish). We show that peers have little incentive to be selfish in our protocol, which means that our protocol is in a sense self-enforcing.

About the Speaker:

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All are welcome!
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