

StreamSocial: A P2P Streaming System with Social Incentives

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Abstract—P2P Streaming has attracted much attention recently with promises for more revenues and better load distribution. In parallel, social networking has changed how people interact using the web. One interesting use-case for next generation IPTV is Social TV. In such a system, users are able to watch some media stream and interact with each other at the same time. While deploying P2P Social TV, one inherent problem in P2P streaming systems remains, how to incite users to contribute. In this demonstration we show how social networks can be used to build new incentive mechanisms. Rather than making social relations a mere addition, we build our streaming system on top of a user's social network. This design greatly simplifies the system and requires no further entities for management. In this demonstration we present the first version of StreamSocial that, based on a plug-in based design, allows users to stream videos while performing social interactions.

I. INTRODUCTION

As visible from [1] and [2], social networking and P2P video streaming have gained tremendous popularity. This has created new opportunities to combine social and streaming mechanisms to build new interesting applications. This is the focus of Social TV that aims at building a platform for both audio/visual interaction and collaboration. In this demonstration, we present StreamSocial, one possible architecture to realize such a Social TV. Using this application, users can share and exchange media streams while having the opportunity to make social interaction.

II. STREAMSOCIAL

StreamSocial is a P2P video streaming application that works by shifting contact management (which is typically handled by a tracker) to the social-based *Contact Management* module.

The basic architecture of StreamSocial is presented in Figure 1. Based on a plugin design, the streaming system can retrieve contact information (and therefore IP/port addresses) from other peers through various social/collaboration networks. The Contact Management module then aggregates these contacts and offers them to the streaming system's core. Information about available video streams are periodically exchanged between peers within the same neighborhood allowing for up-to-date information about the streams available within one's social neighborhood. Our system uses the Mplayer [3] for the actual playback.

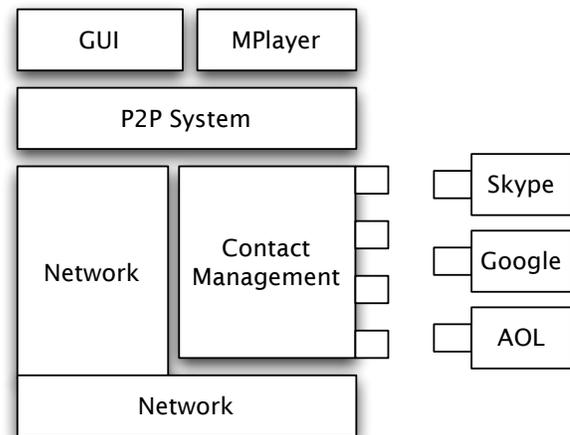


Fig. 1. StreamSocial architecture

The aspect of social incentives is interesting for next generation P2P streaming systems where upload capacities of distributed peers are sufficient to provide sustainable bit-rates. Several solutions have been proposed for the problem of incentives in P2P systems, starting from the BitTorrent Tit-for-tat [4] incentive mechanism to the streaming optimized Give-to-get mechanism proposed in [5]. In contrast to such systems, where the incentive mechanism is within the core of the protocol, StreamSocial separates the incentive mechanism from the streaming functionality and is based on mutual trust between different social buddies. Rather than designing new incentive mechanism, the aim of our work is demonstrate how social-based incentives can be implemented in a P2P scenario.

III. DEMONSTRATION SCENARIO

The demonstration will make use of the Skype [6] social network. It will start by presenting how the streaming system is built over this social network where the application visualizes the social network and available streams. After a stream has been selected, data transmission starts and, after some startup time, MPlayer is automatically launched and playback starts.

The application offers various real time statistics and graphs to get a feel of performance. We hope to arise the attention of the viewers to incite them to discuss our algorithms and

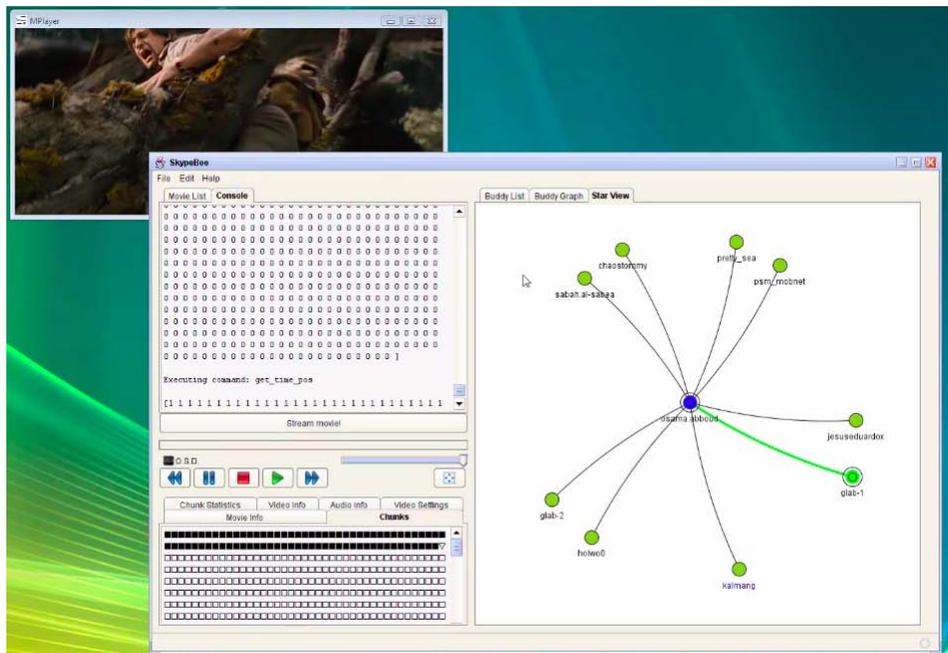


Fig. 2. A screen shot of StreamSocial in action with various real time statistics.

ideas. These statistics include a live buffer-map that shows what chunks have already been downloaded. Additionally the viewers can see current upload and download speeds, list of all connected peers, and information about the video stream. Furthermore, the application shows the aggregated social network with download speed per link across this network. The GUI of the StreamSocial application is presented in Figure 2.

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