

Quality Adaptive Peer-to-Peer Streaming Using Scalable Video Coding

Osama Abboud*, Konstantin Pussep, Aleksandra Kovacevic,
and Ralf Steinmetz

Multimedia Communications Lab,
Technische Universität Darmstadt,
Merckstr. 25, 64283 Darmstadt, Germany
{abboud, pussep, sandra, steinmetz}@kom.tu-darmstadt.de
<http://www.kom.tu-darmstadt.de/>

Abstract. P2P (Peer-to-Peer) video streaming has attracted much attention recently. However, streaming over P2P is still best effort and suffers from lack of adaptation. Therefore, video streaming over P2P either works or not. In this paper, we propose a P2P streaming system with an inherent support for adaptation. By leveraging scalable video coding, our system is able to adapt to different requirements and constraints that heterogeneous peers have in today's Internet. We make a subtle distinction between initial and progressive quality adaptation, which allows for precise adaptation to various parameters of the system and the P2P network. Our decision-taking algorithms for quality adaptation help not only in perfectly matching QoS to resources but also in bringing the P2P network to self organization.

Keywords: P2P, video streaming, SVC, adaptation, QoS.

1 Introduction

Video streaming has recently become the most traffic intensive application in the Internet. Studies [1] show that streaming a video is becoming preferred over video file sharing. One reason behind this, is that a video is usually viewed only once, therefore streaming helps in reducing storage space requirements. In addition, streaming allows for the convenient *watch while you download* experience.

Current technologies for streaming are based on either the client/server or the Peer-to-Peer (P2P) architectures. As an example of client/server streaming, Youtube [2] is a popular medium for viewing user generated content. However, although YouTube provides good performance with high availability rate, it only supports low quality videos. Moreover, YouTube inflicts enormous costs [3]. P2P, on the contrary, allows for a cost efficient solution for video delivery to potentially large audiences. It also provides desirable traits such as self organization

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