

QoE Control using SVC in Future P2P Video Streaming

Concept

- ▶ Quality of Experience (QoE) of Video Streaming depends on a number of QoS parameters
- ▶ Video quality should be adapted to device and access network capabilities
- ▶ Scalable Video Codecs (SVC) is a H.264 extension that allows for the separation of a video stream into substreams with different demands and levels of quality
- ▶ In combination with P2P technology SVC may allow for an easy (e.g., on click) adaptation of quality

QoE metrics

- ▶ User perceived QoE is affected by bad QoS parameters like packet loss, insufficient bandwidth, etc.
- ▶ This leads to Stalling / Artifacts in case of TCP / UDP



w/o packet loss



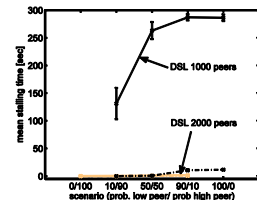
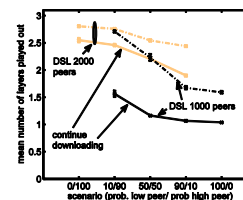
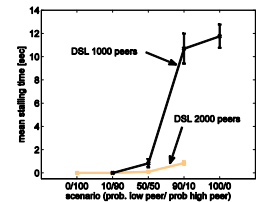
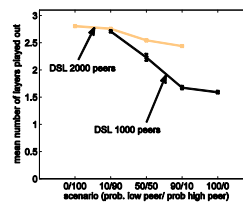
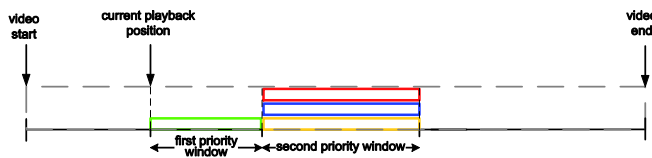
with packet loss

UDP – Videostreaming of a H.264/AVC encoded file

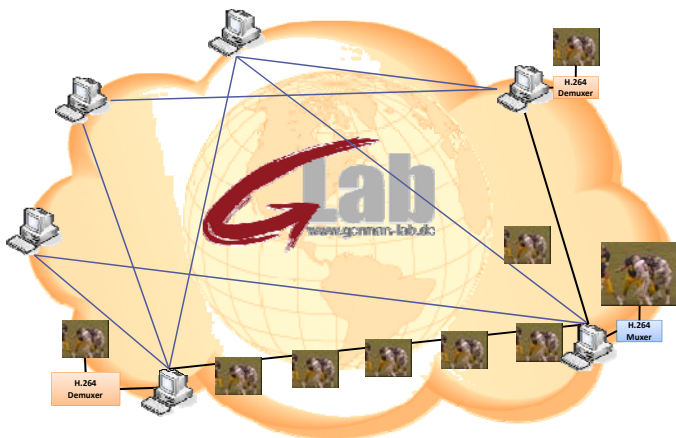
- ▶ Objective QoE estimation with PSNR, SSIM, VQR, ...
- ▶ Adaption of QoE Metrics for the usage with SVC

Performance Evaluation of the Mechanisms

- ▶ Simulation as a means to pre-select mechanisms before implementing them
- ▶ Evaluation conducted for a VoD overlay supporting a SVC video with temporal scalability
- ▶ Results show good adaptation of the new cooperation strategy to varying network situations



Implementation in G-Lab



- ▶ Use layer-based concept of SVC to split video at the source and provide required sub stream
- ▶ Advantages:
 - ▶ Adaptation to network conditions (bandwidth, latency, etc.)
 - ▶ Adaptation to user equipment (e.g. screen resolution, processing power, etc.)
- ▶ Use cases:
 - ▶ Seamless switching between different qualities (e.g., HQ button, YouTube)
 - ▶ P2P-based video delivery (together with TUD)