

Network Metrics affecting Video Streaming Quality of Experience

Research questions :

- 1) What are the network metrics that affect the user's Quality of Experience during video streaming?
- 2) Can we define the relationship between network metrics and the Quality of Experience of the end-user?



Network impairments causing frame dropping and eventually leading to lower QoE

Context : Internet video streaming has become extremely popular in the recent years. In 2012, Internet video traffic accounted for 57% of all consumer Internet traffic [1]. This percentage is predicted to increase even more and reach 69% by 2017 [1]. At the same time, High Definition (HD) video traffic has surpassed Standard Definition traffic and has already become the de facto quality level consumed by users [2].

The popularity of video streaming has put a big strain on the network that now has to transfer an enormous amount of data end-to-end. Unlike traditional web transfers, video streaming requires sustained performance over extended periods of time [3]. Unstable network performance causes video streaming impairments (e.g. frame dropping, frame freezing, constant re-buffering etc.) that lead to poor Quality of Experience (QoE) for the end-user. For example, low throughput could lead to high start-up video streaming delays, that lead to user frustration and diminish user engagement [3, 4]. For this reason, there has been an increase of video streaming supporting technologies (e.g. video caching, Content Distribution Networks etc.) that target particular network metrics that affect video streaming with the aim of increasing QoE for the end-user.

The aims of the project are to :

- 1) **Identify the network metrics** that affect the Quality of Experience (QoE) for the end-user during video streaming (live and on-demand).
- 2) **Identify how a video caching solution** could target to improve the said network metrics so that the user's QoE gets increased.
- 3) **Devise a framework** that defines the relationship between the said network metrics and the user's QoE during video streaming.
- 4) **Evaluate the devised framework** with subjective and/or objective video streaming experiments.

Requirements : This challenging project requires a student with computer networks knowledge. Video streaming and/or mathematics background is a plus (but not a requirement).

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References :

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