MPEG-DASH Proxy Live Streaming in Unstable Environment

Abstract:

MPEG-DASH (Moving Picture Experts Group - Dynamic Adaptive Streaming over HTTP) is a vendor independent, international standard ratified in 2012. One of the main benefits of MPEG-DASH is reduction of startup delays and buffering/stalls during the video and continued adaptation to the bandwidth situation of the client. Today, MPEG-DASH is gaining more and more deployments, accelerated by services such as Netflix or Google, which recently switched to this new standard. With these two major sources of internet traffic, 50% of total internet traffic is already MPEG-DASH.

The basic idea of MPEG-DASH is as follows: chop the media file into different bitrates or spatial resolutions encoded segments. The segments are provided on a Web server and can be downloaded through HTTP standard compliant GET requests where the HTTP Server serves different qualities, chopped into segments of equal length. Since the client knows its capabilities, received throughput and the context of the user best - the adaptation to the best bitrate or resolution is done on the client side for each segment.

In certain cases, there is a need for multiple clients to receive the same video stream. Since the client’s bandwidth and connection quality can vary, the challenge is to stream to each client the best possible quality, using MPEG-DASH Proxy, while maintaining live streaming. A greater challenge is to support in addition cases where the server’s network connection is not stable.
MPEG-DASH Stream Server

MPEG-DASH Proxy

MPEG-DASH Client

MPEG-DASH Android Client
Goals:

1. Refer to projects from last semester:
   https://gitlab.cs.technion.ac.il/lccn/w2019-mpeg-dash-proxy
2. Raise mixed virtual and physical clients environment in Mininet-WiFi as followed:

3. Integrate to MPEG-DASH Android client the new algorithms (including ML)
4. Improve the prediction algorithms using Machine-Learning
Requirements:
Introduction to Networking (Must), Internet Networking (Optional)

Programming Language:
Python, Java Script

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