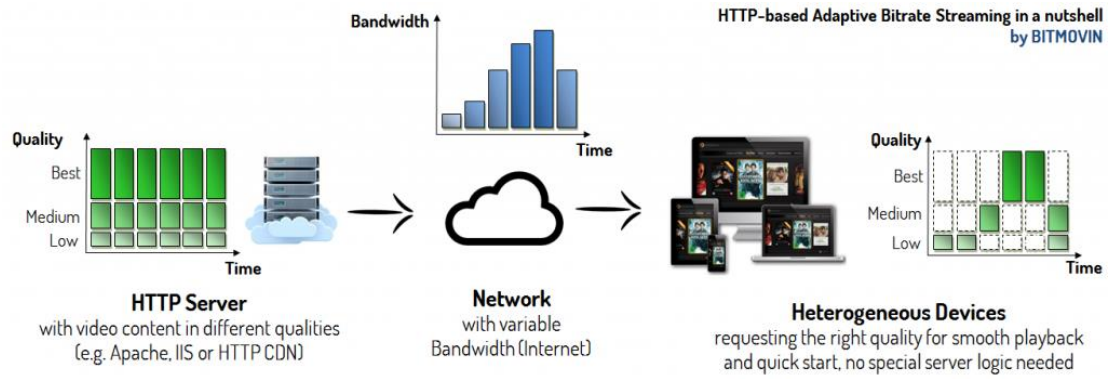
MPEG-DASH Proxy Live Streaming

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.

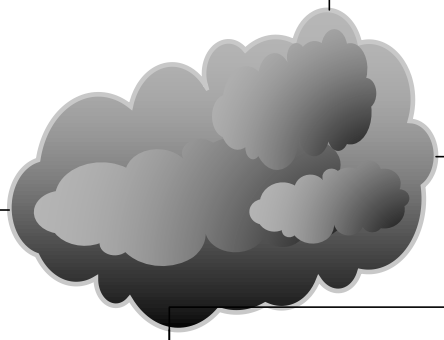
The basic idea of MPEG-DASH is as follows: chop the media file into different bitrates or spatial resolutions encoded segments. The segments are provided on a Web server and can be downloaded through HTTP standard compliant GET requests where the HTTP Server serves different qualities, chopped into segments 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.

MPEG-DASH Stream Server

MPEG-DASH Proxy



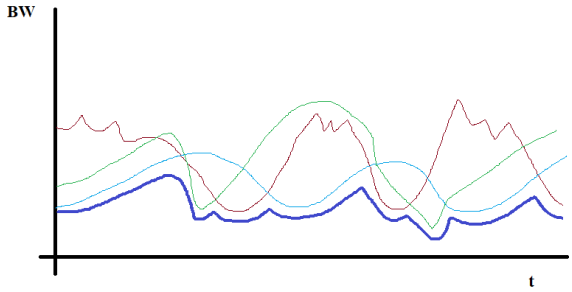
MPEG-DASH Client

MPEG-DASH Client

MPEG-DASH Client

Goals:

1. Refer to project from last semester: https://gitlab.cs.technion.ac.il/lccn/s2019-mpeg-dash-live-streaming
2. Implement MPEG-DASH proxy that will assure best quality to each client while maintaining live streaming (sub 1-sec)
3. Video Streams – Tests should include changing the below parameters on the client's side:
    - Frame Rate
    - Bit Rate
    - Bandwidth (stream)
    - Resolution
4. Possible solution: Proxy to track lowest client quality:



Requirements:

Introduction to Networking (Must), Internet Networking (Optional)

Programming Language:
Python

Guided by:
Itzik Ashkenazi, Aviel Glam (Rafael)