ELASTIC DASH SYSTEM

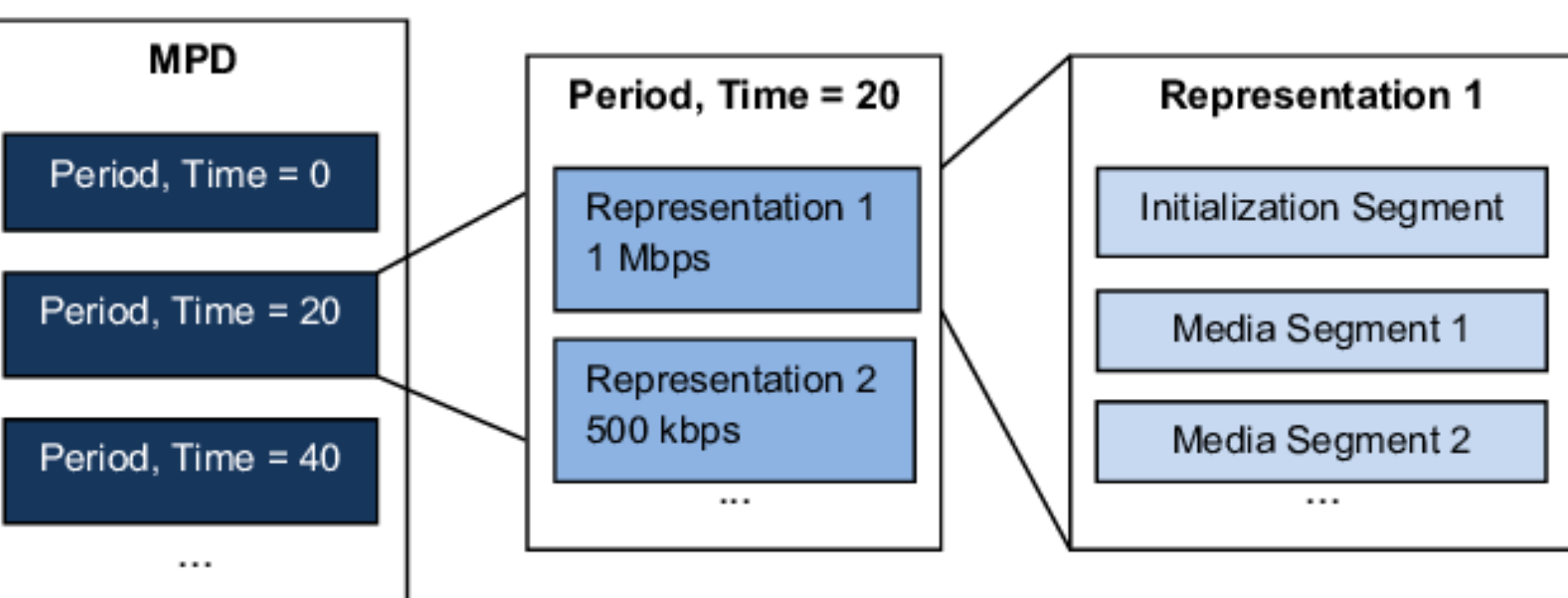Dong Boyu, Li Sicong, Yan Xutianren, Zeng Hui

Introduction

What is DASH? Why use it?

58%

of all downstream internet traffic is video.

The diversity of network environments and playback devices requires adaptive streaming. Dynamic Adaptive Streaming over HTTP (DASH) is gaining momentum due to its simplicity.
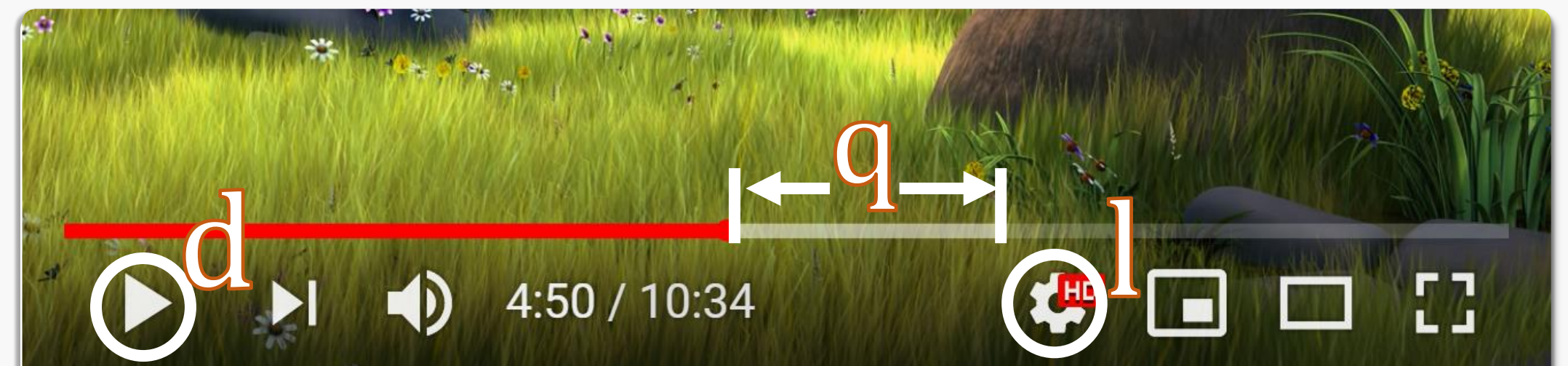

MPD File

Media Presentation Description

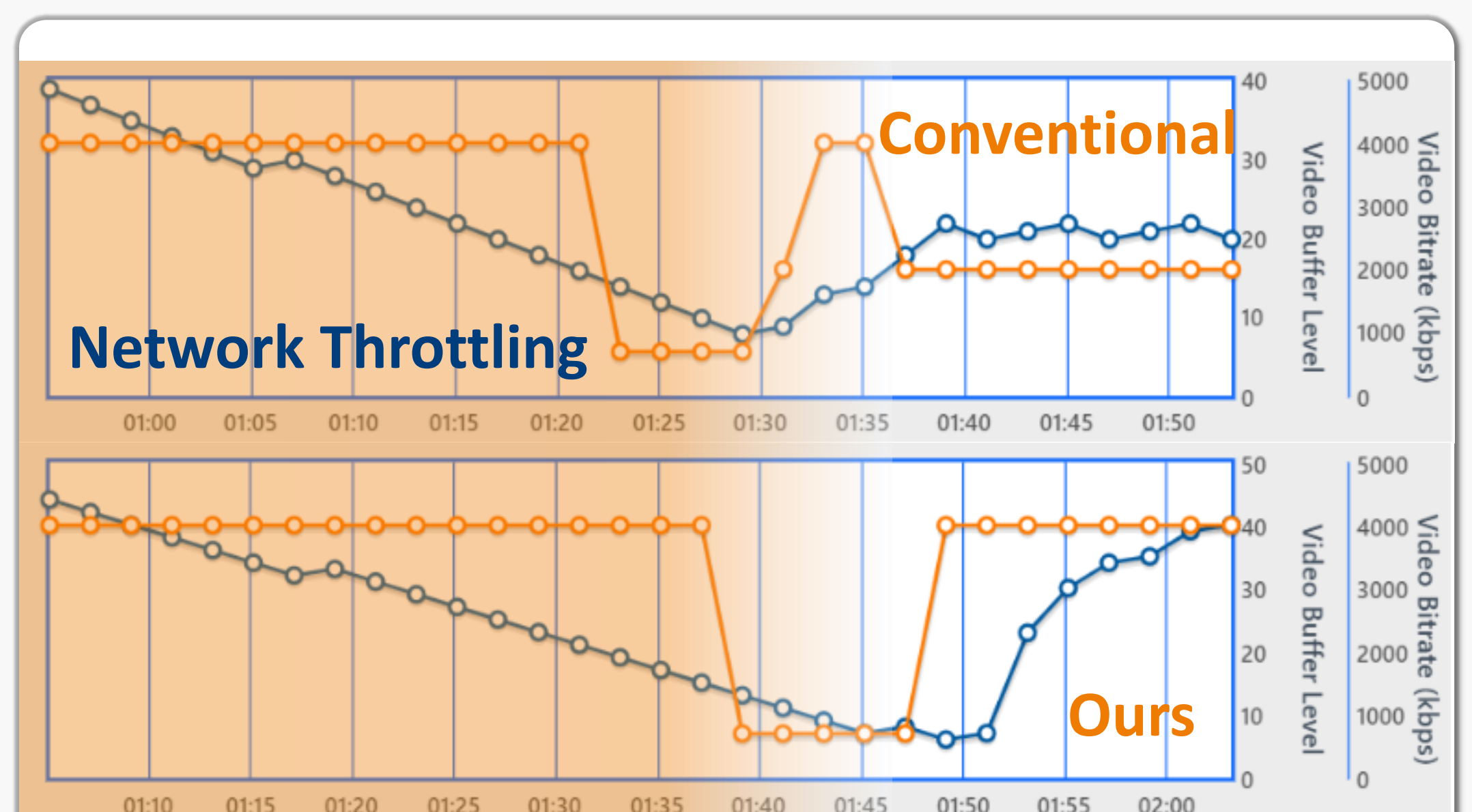## Controller

Decide which quality to play according to ABR

3840x2160 / 12000 kbps / 30 fps
1920x1080 / 8000 kbps / 30 fps
Frame 681: PTS Frame 696: PTS=0

ABR Algorithms: ELASTIC

Feedback Linearization Adaptive Streaming Controller

On Stream Segment Download:

$$\Delta T \leftarrow getDownloadTime()$$
$$S \leftarrow getSegmentSize()$$
$$d \leftarrow isPlaying()$$
$$q \leftarrow getQueueLength()$$
$$r \leftarrow h(S/\Delta T)$$
$$qI \leftarrow qI + \Delta T(q - qT)$$
$$l \leftarrow Quantize\left(\frac{r}{d - k_p q - k_i qI}\right)$$

We set $k_p = 0.1$, $k_i = 0.001$, $qT = 15$. The output l is the video quality level.

Result & Comparison

Ours vs Conventional Algorithms

Our algorithm produces a more stable quality switching when fluctuation occurs.