



# Streaming Optimisation

MHV'24

Thierry Fautier

Managing Director Your Media Transformation

@thierryfautier

# Plan

Forewords

Codec

Beyond Codec

Orchestration

Check Point #1

Devices

Throttling

Check point #2

Conclusion





# Forewords

- Codec is an ongoing discussion for the last 30 years:
  - MPEG pace of one codec every 10-7 years
  - AOM coming with its own “line of codecs”
  - Non codec improvements to be considered
- Base in all discussions : AVC
- For Streaming what counts is what is consumed by devices
- Presentation looks at :  
Codecs x improvements x devices x usage x (optional) throttling

**Let's dive in ...**

# Super Bowl LV III Check



100 M + broadcast eyeballs

10 M + Streaming eyeballs

How optimized is it?



# Codec & Streaming

- New codec only addresses compatible devices
- Meaning need to feed legacy devices with legacy codec
- Model based on :
  - Recent US numbers (WBD, Comcast)
  - Estimated BW saving, across variety of content



# Codec Table

Codec	AVC	HEVC	AV1	Total
Bandwidth	100	60	42	
Popularity	35%	60%	5%	100%
Traffic	35	36	2.1	73.1
Contribution	48%	49%	3%	
New codec saving		27%		

**AVC is still very high on traffic**



# Beyond Codec Improvements: CAE

- Different results achieved depending on :
  - on Live vs VOD
  - use of AI or not
  - Codec type : AVC vs HEVC
- We will assume\* 40% saving for AVC and 20% for HEVC , backed by deployment numbers of different solutions
- Additional saving vs 100% AVC : 48% across all codecs

*\*backed by deployment numbers of different solutions*



# Beyond Codec Improvements: AI

- Different techniques applied
  - Dynamic encoding parameters ~ CAE
  - Dynamic ladder : ~10-20%
  - Dynamic Resolution : 20-50%
- We will assume\* 30% saving for aggregating all AI technologies

*\*backed by deployment publications (Netflix, Harmonic, MediaKind, Bitmovin)*





# Beyond Codec Improvements: Orchestration

- Concept: provide more encoding resources to higher content tail and less on longer tail to provide better / worst compression efficiency
- Assumptions
  - Long tail : 20% content | 80% traffic : -20% bitrate
  - Short tail : 80% content | 20% traffic : +20% bitrate



# Orchestration Table

Content	High tier	Low tier	Total
Library	20%	80%	
Bitrate	100	100	
Popularity	80%	20%	
Default traffic	80	20	100
Derating	80%	120%	
Optimized traffic	64	24	88
Saving	12%		



# Results: Check Point #1

Scenarios	Codecs	CAE	Orchestration	AI
<b>Savings</b>	<b>27%</b>	<b>48%</b>	<b>12%</b>	<b>30%</b>
Codec	27%			
CAE + Codec		67%		
CAE + Codec + Orch			67%	
CAE + Codec+ Orch+AI				77%

**Range of saving : 27-77% (3x)**



# Devices Distribution\*

Device	Share of viewing hours
Connected TV	77%
Smartphones	11%
PCs	7%
Tablets	5%

*\*Source Conviva report'22*



# Throttling

- Backing facts :
  - Zero rating already applied to Mobile (in US)
  - During COVID-19, UHD profile was withdrawn, and was kept by some services
- We assume we will send :
  - only HD to TVs and PCs
  - only SD to mobile devices (i.e., smartphones and tablets)
- Associated BW saving across all devices : 25%



# Results: Check Point #2

Starting point	No QoE Change	QoE Change	Total saving
100% AVC	77%	No	77%
	77%	25%	83%
Next gen codec + CAE	38%	No	38%
	38%	25%	54%




# Super Bowl LV III: Assumptions

- Codec :
  - No AV1
  - HEVC deployed on HD partly and UHD entirely
- CAE : deployed
- Network optimization :
  - UHD to TV
  - HD to PC
  - SD to mobile

# Results: Superbowl LV III

Starting point	No QoE Change	QoE Change	Total saving
Next gen codec + CAE	38%	33%	58%



**Additional 38% additional saving potential**



# Conclusion



AVC is still a pain point in streaming efficiency

BW reduction possible using various techniques : CAE, AI, Orchestration

Resulting saving can range from 38% (NG codec + CAE) -77% (AVC)

Device centric throttling can bring additional 25% saving

Resulting saving can go up to 54% (NG codec + CAE) -83% (AVC)

