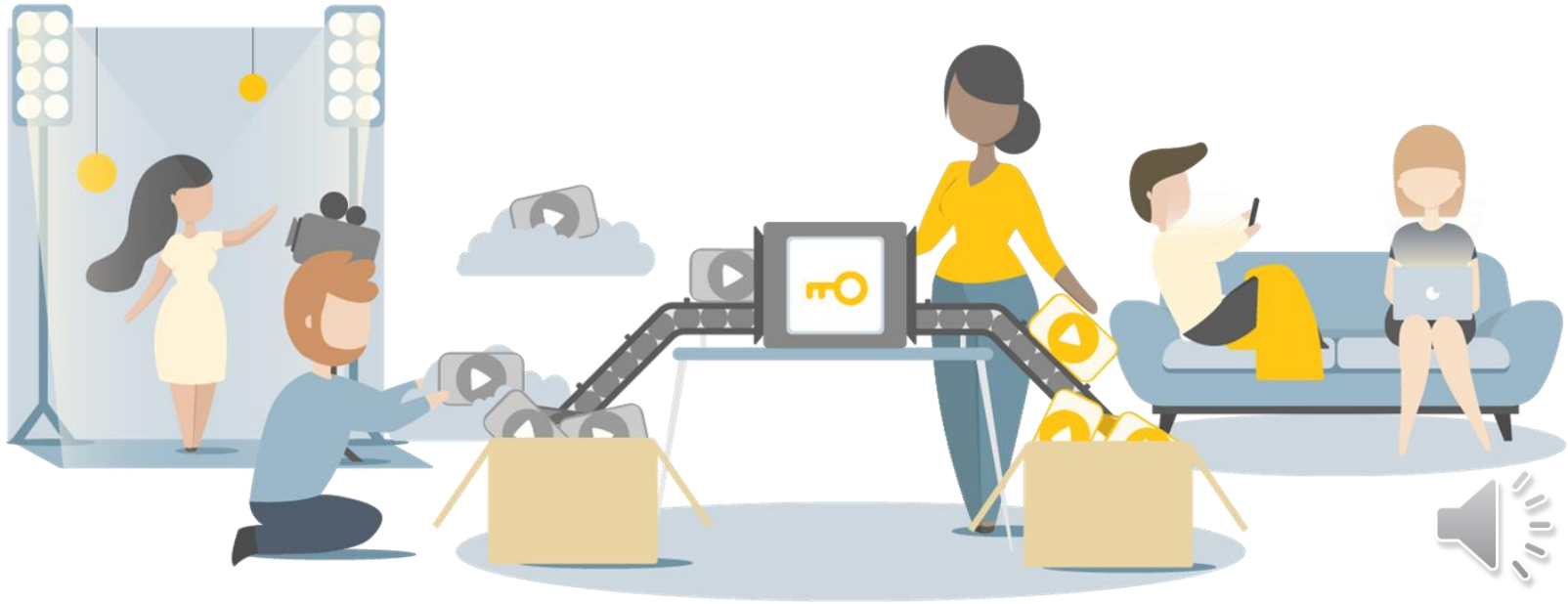
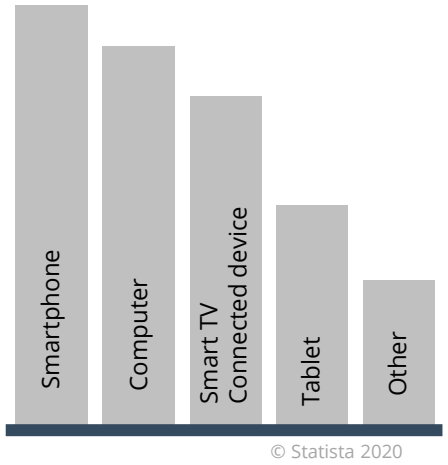
OPERATOR GRADE LEANBACK TV EXPERIENCE WITH OTT STREAMING

THEO/Synamedia/Fastly

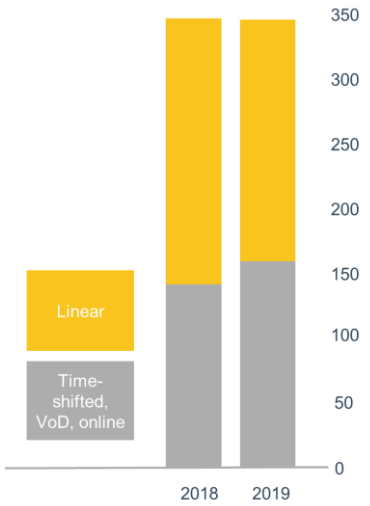


VIEWING HABITS AND OPPORTUNITIES CHANGED TOWARDS OTT.

The number of target devices and target platforms is increasing.



Time shifted viewing is important and increasing.



Viewer expectations increase

Zapping & start times

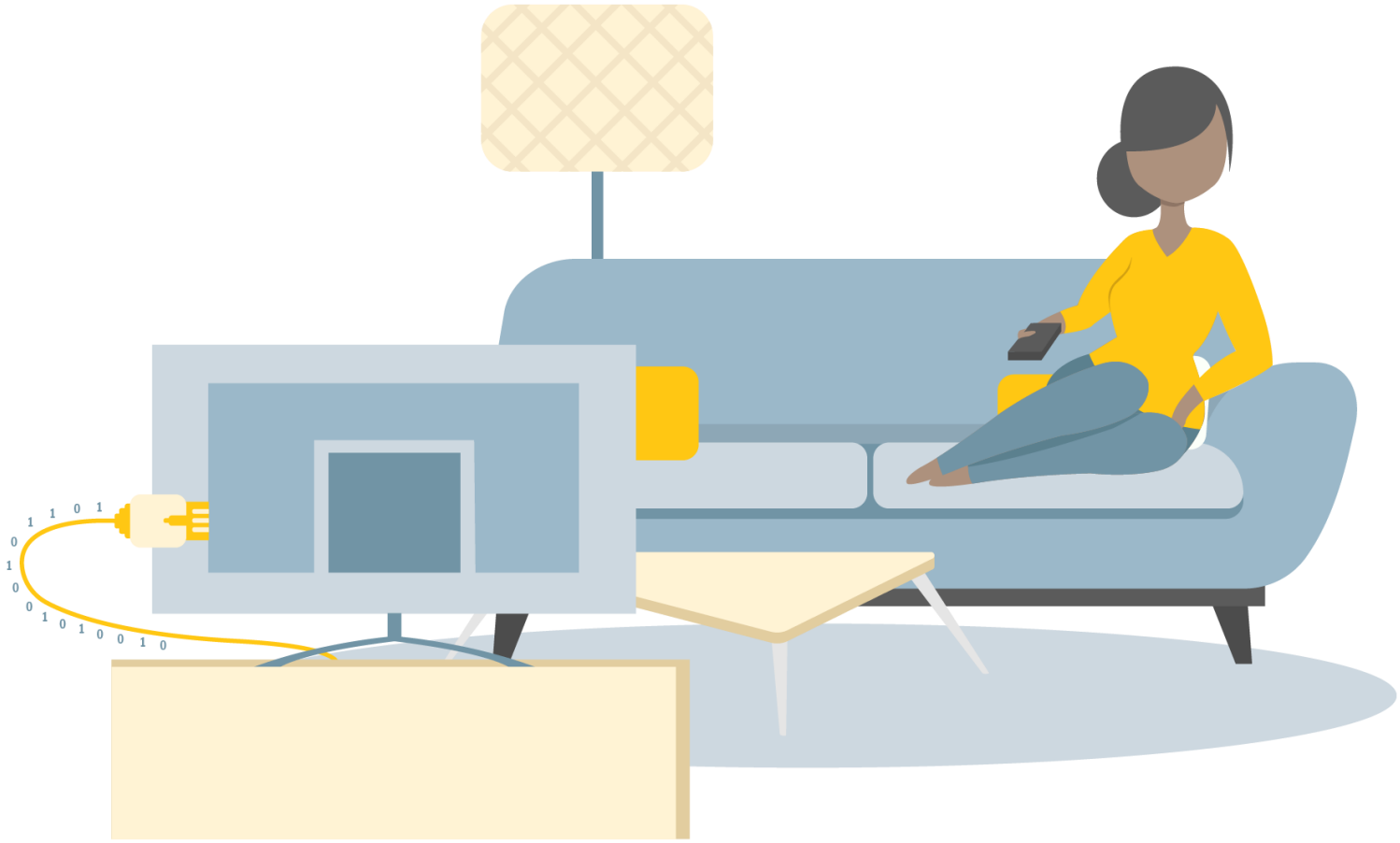
Latency

Quality

Increasing offer

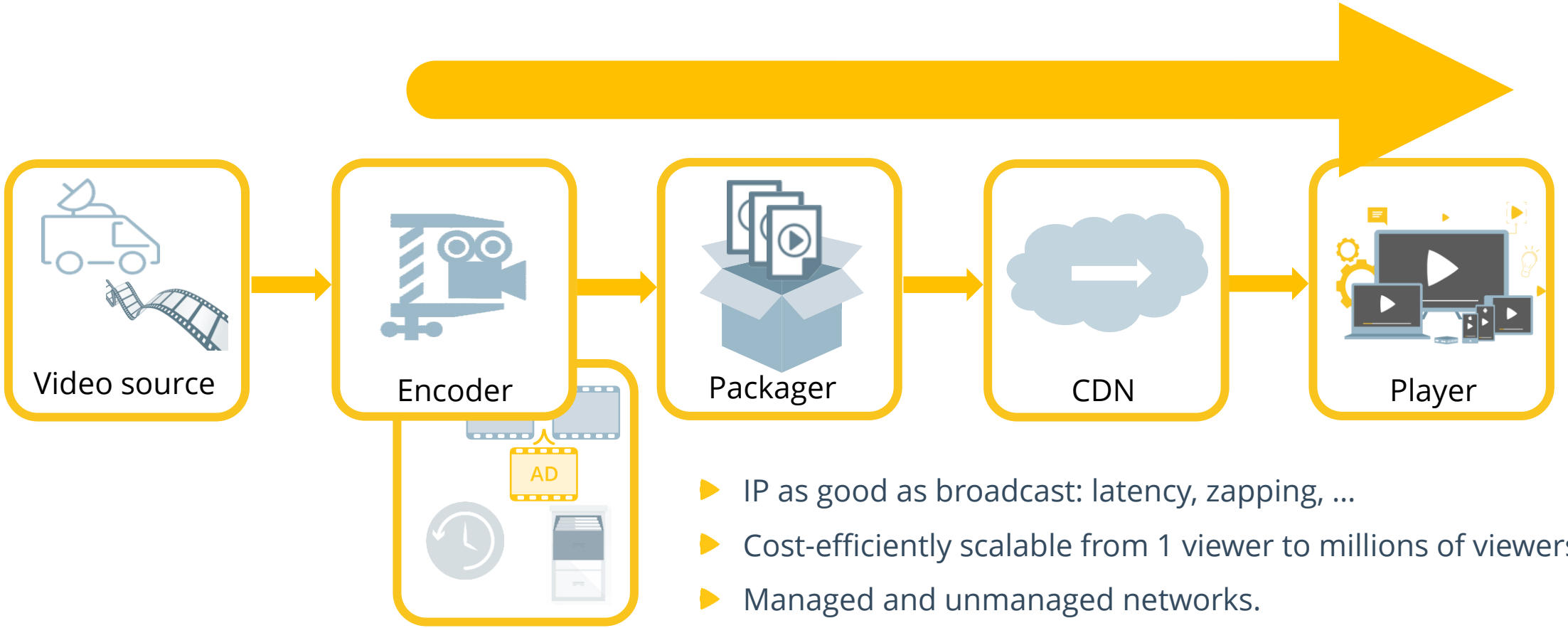
Disney+ tv+ HBO max prime video NETFLIX

OPERATORS NEED AN OTT SOLUTION AS GOOD AS BROADCAST



- Universal reach:
  all networks, all devices.
- High video quality.
- Low latency, fast zapping.
- Leanback user experience.
- Interactivity & direct
  customer reach

THE OTT STREAMING PROTOCOL IS KEY!



- IP as good as broadcast: latency, zapping, ...
- Cost-efficiently scalable from 1 viewer to millions of viewers.
- Managed and unmanaged networks.
- Network resource optimization: Unicast with ABR, multicast, seamless transition.

THEO

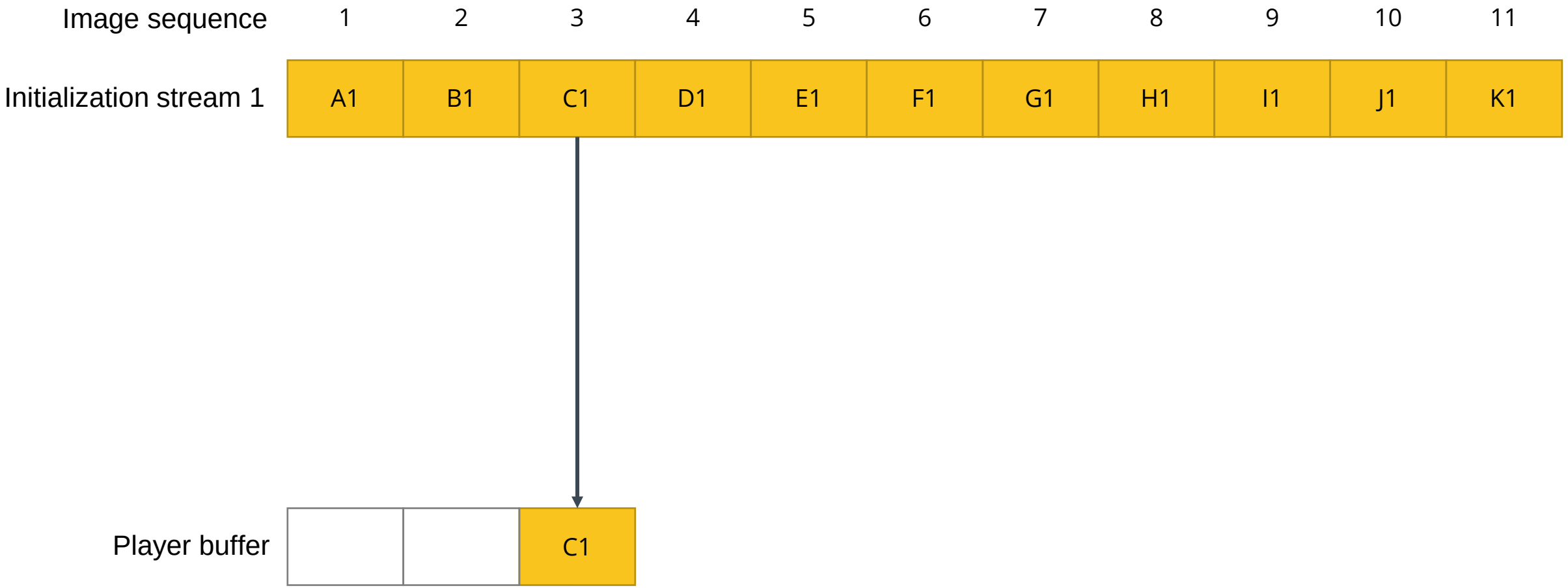
HESP - HIGH EFFICIENCY STREAMING PROTOCOL

	HESP	CMAF-CTE	LL-HLS	HLS/DASH	WebRTC	RTMP
Latency	Ultra-Low	Low	Low	High	Ultra-Low	Ultra-Low
Bandwidth	Low	Medium	Medium	Low	High	High
Zapping Time	Ultra-Low	Trade-Off	Trade-Off	Trade-Off	Low	Low
Scalability	Low Cost	Low Cost	average	Low Cost	High Cost	High Cost
Cross-Platform	Yes	Almost	Yes	Yes	Almost	No
ABR	Yes	Yes	Yes	Yes	No	Yes

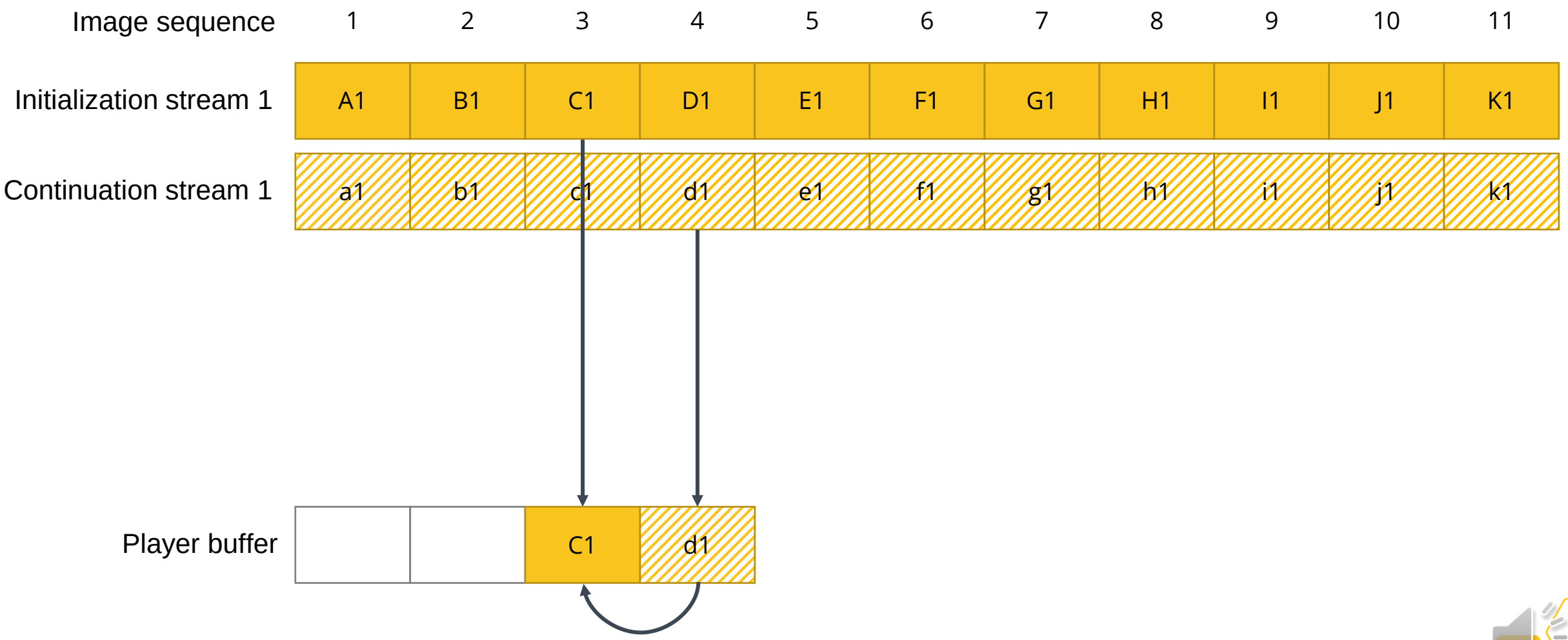
HESP FUNDAMENTALS = SIMPLICITY
REDUCING OVERHEAD AND INCREASING PERFORMANCE

MINIMALISTIC MANIFEST	▶ Manifest is not needed to start playing the stream. ▶ Low frequency updates
HTTP DELIVERY	▶ HTTP/1.1 based (HTTP/1.1 CTE & Range Requests) ▶ HTTP/2 frame based streaming
TWO COMPLEMENTARY STREAMS	▶ Initialization stream: can request images at any moment to start playback ▶ Continuation stream: can continue playback after any initialization stream image

HESP FUNDAMENTALS = TWO COMPLEMENTARY STREAMS



HESP FUNDAMENTALS = TWO COMPLEMENTARY STREAMS



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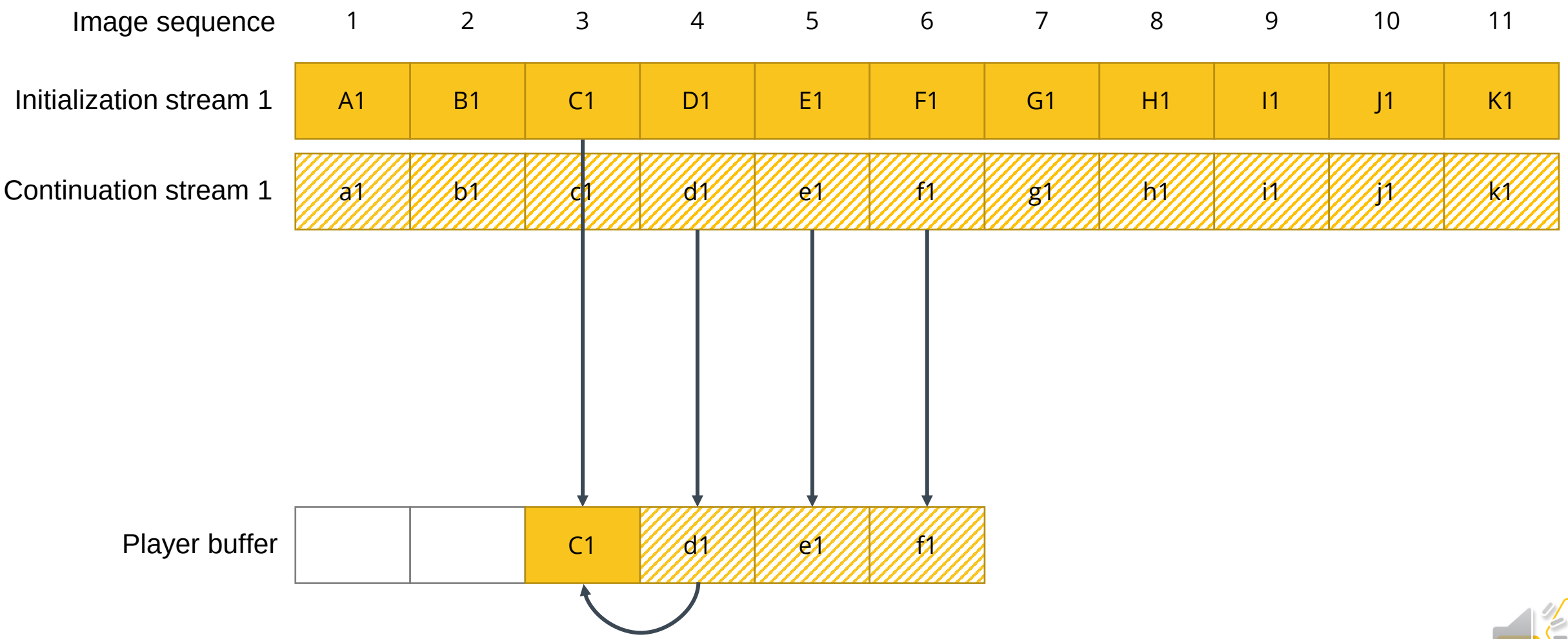

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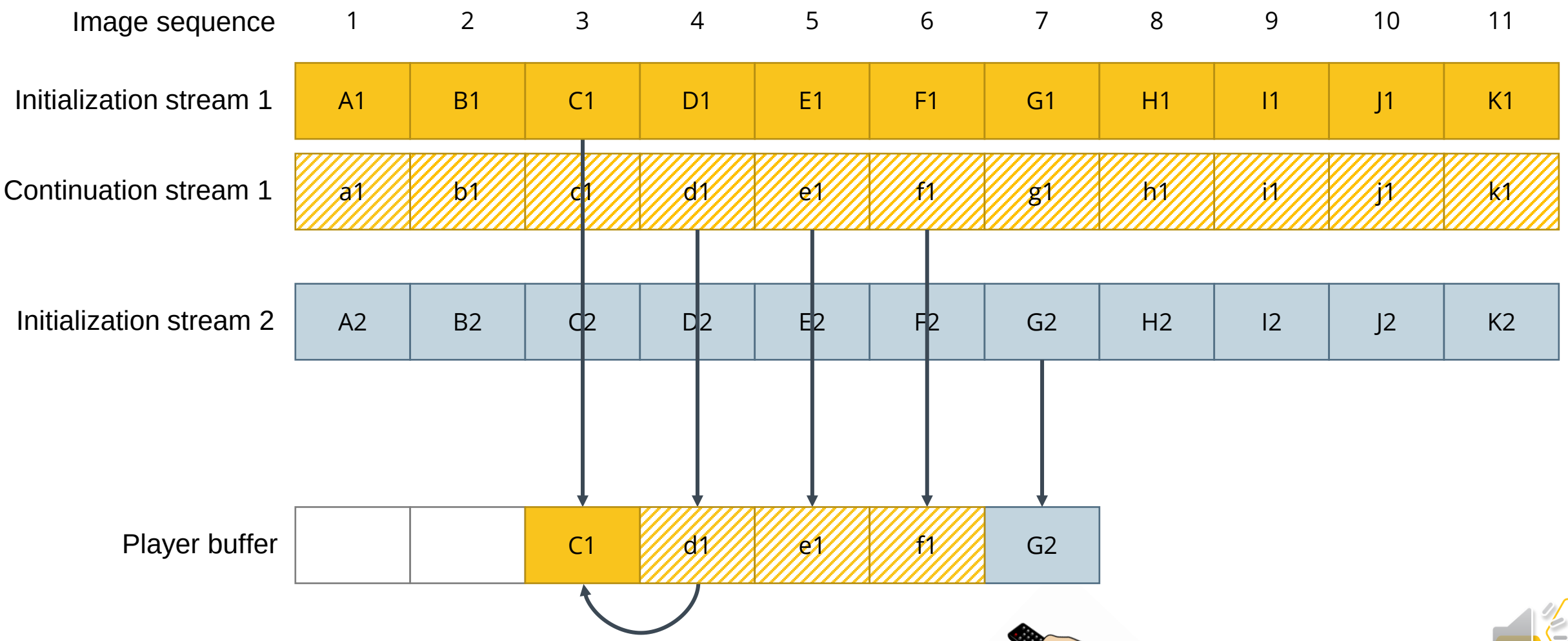

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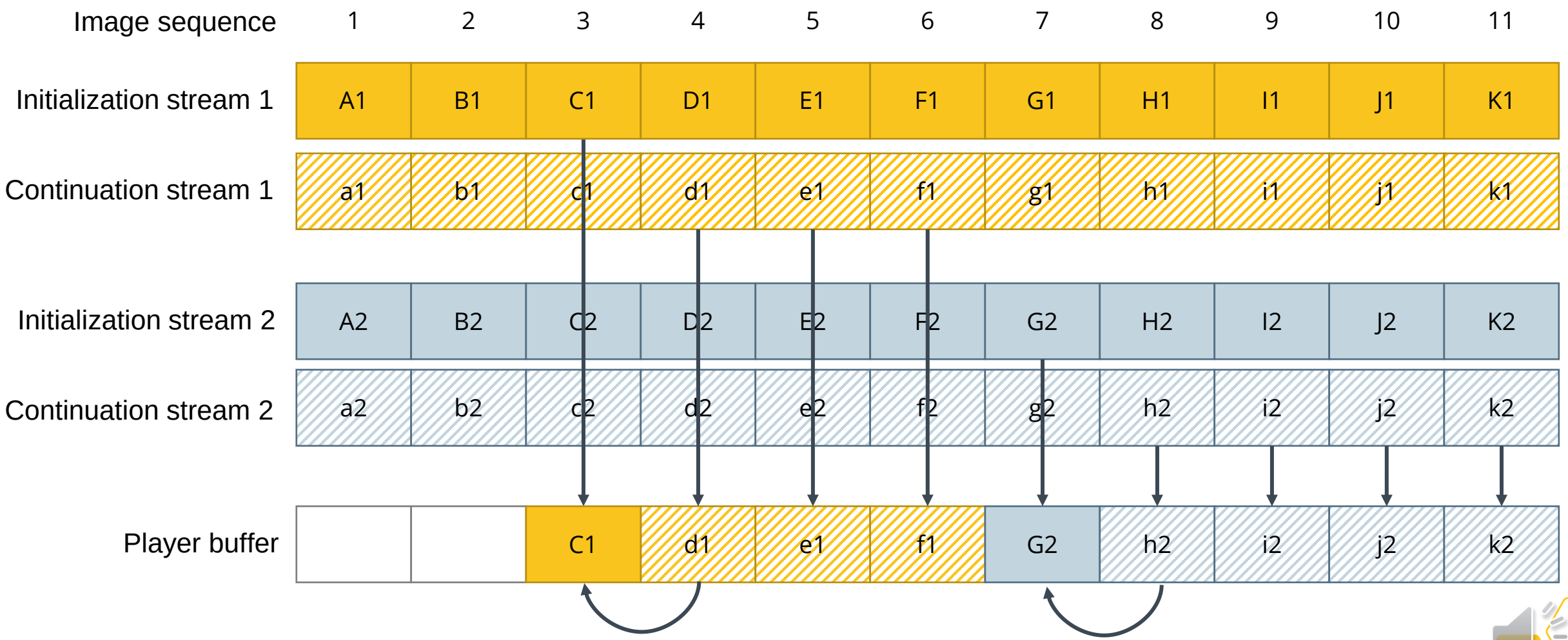
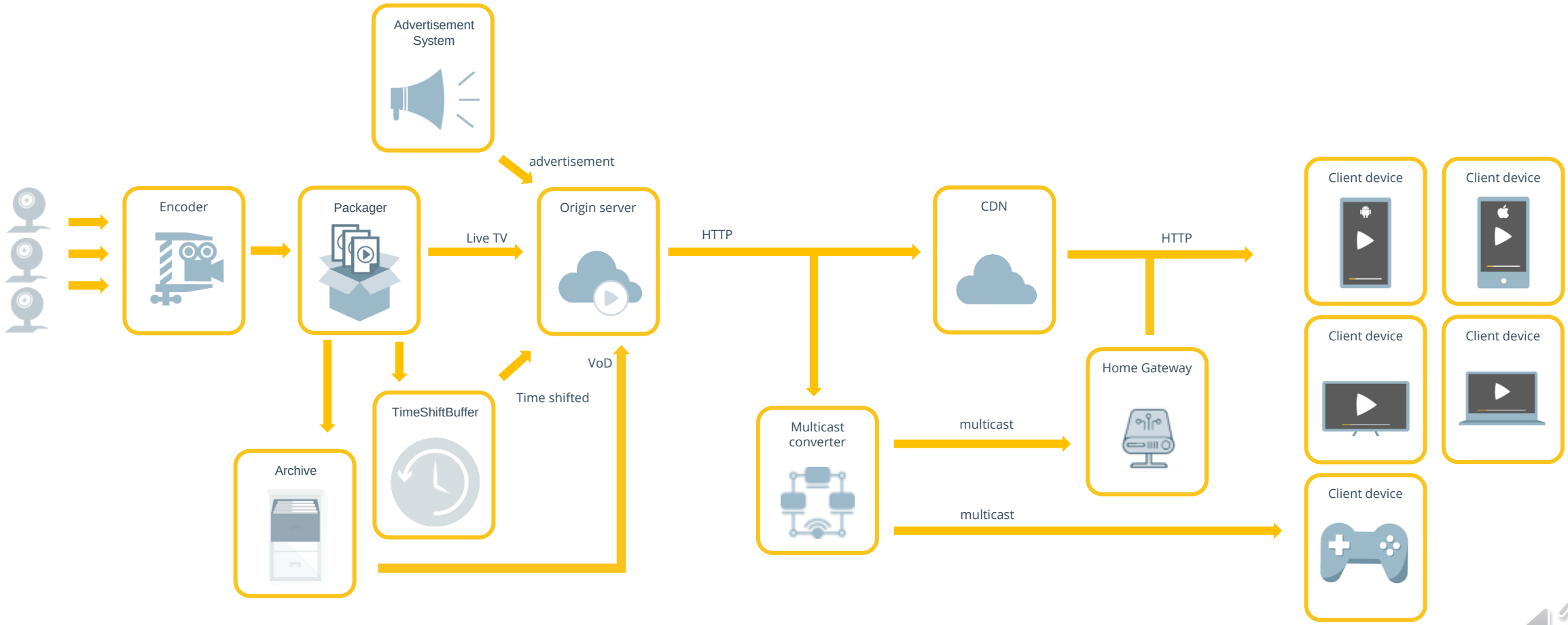
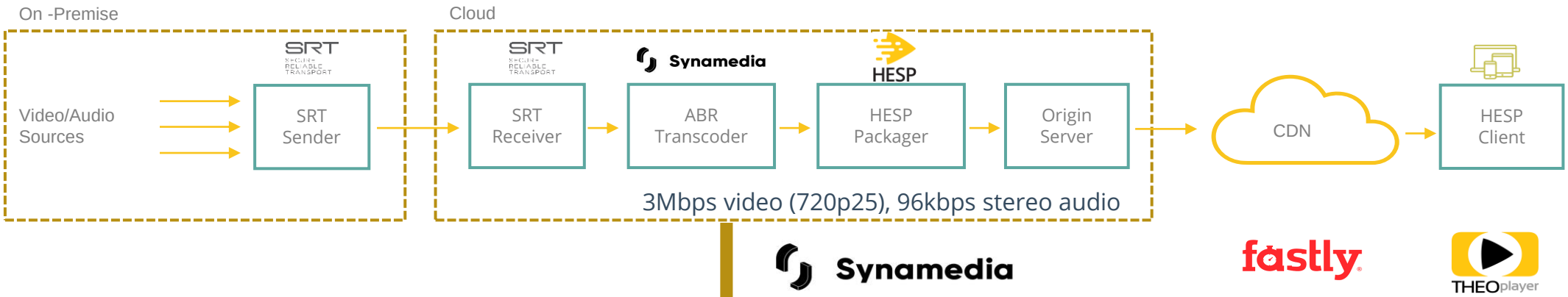


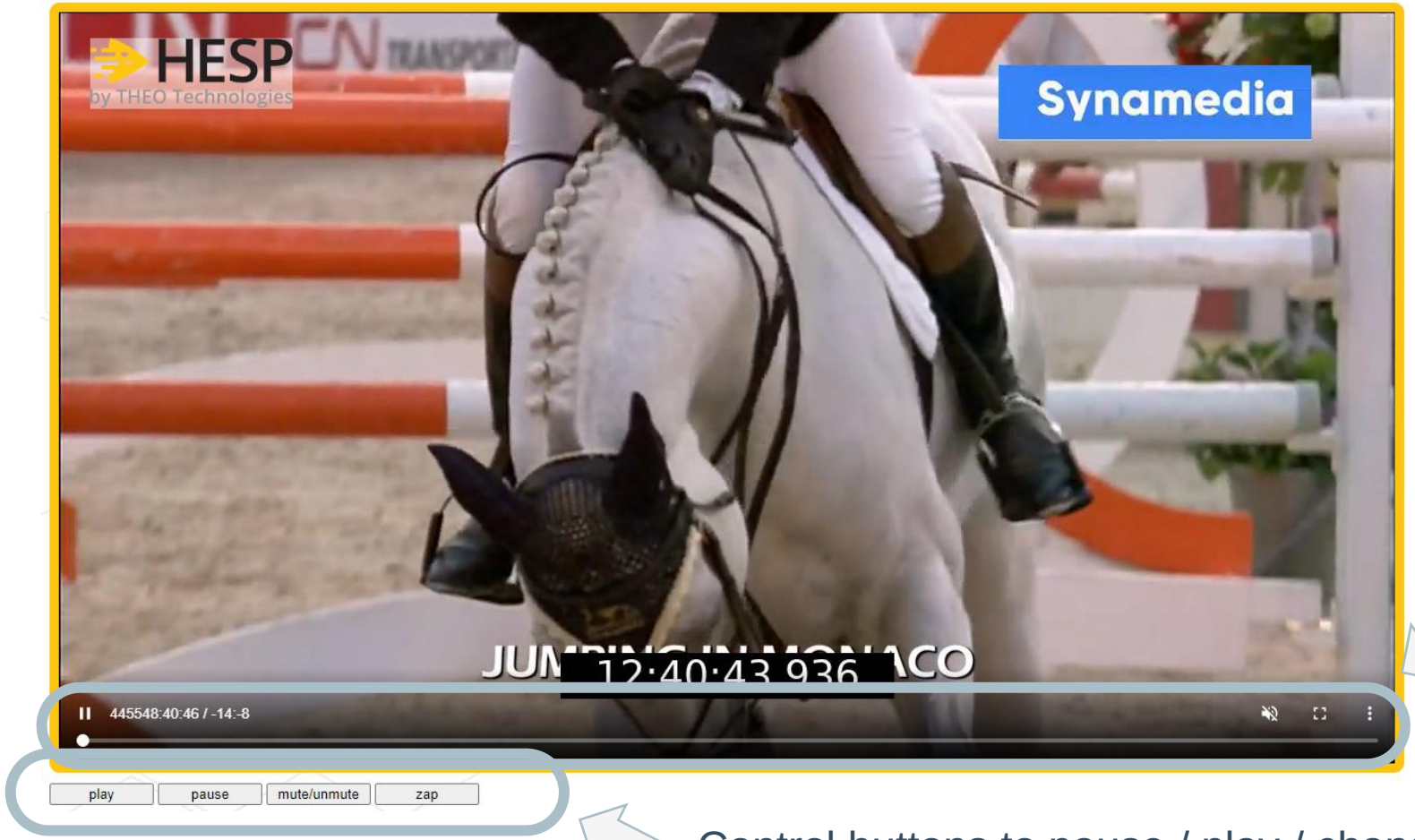
SYSTEM ARCHITECTURE



TRIAL SETUP


On -Premise
Cloud
Video/Audio Sources
SRT Sender
SRT Receiver
Synamedia
ABR Transcoder
HESP
HESP Packager
Origin Server
CDN
HESP Client
3Mbps video (720p25), 96kbps stereo audio
Synamedia
fastly
THEOplayer

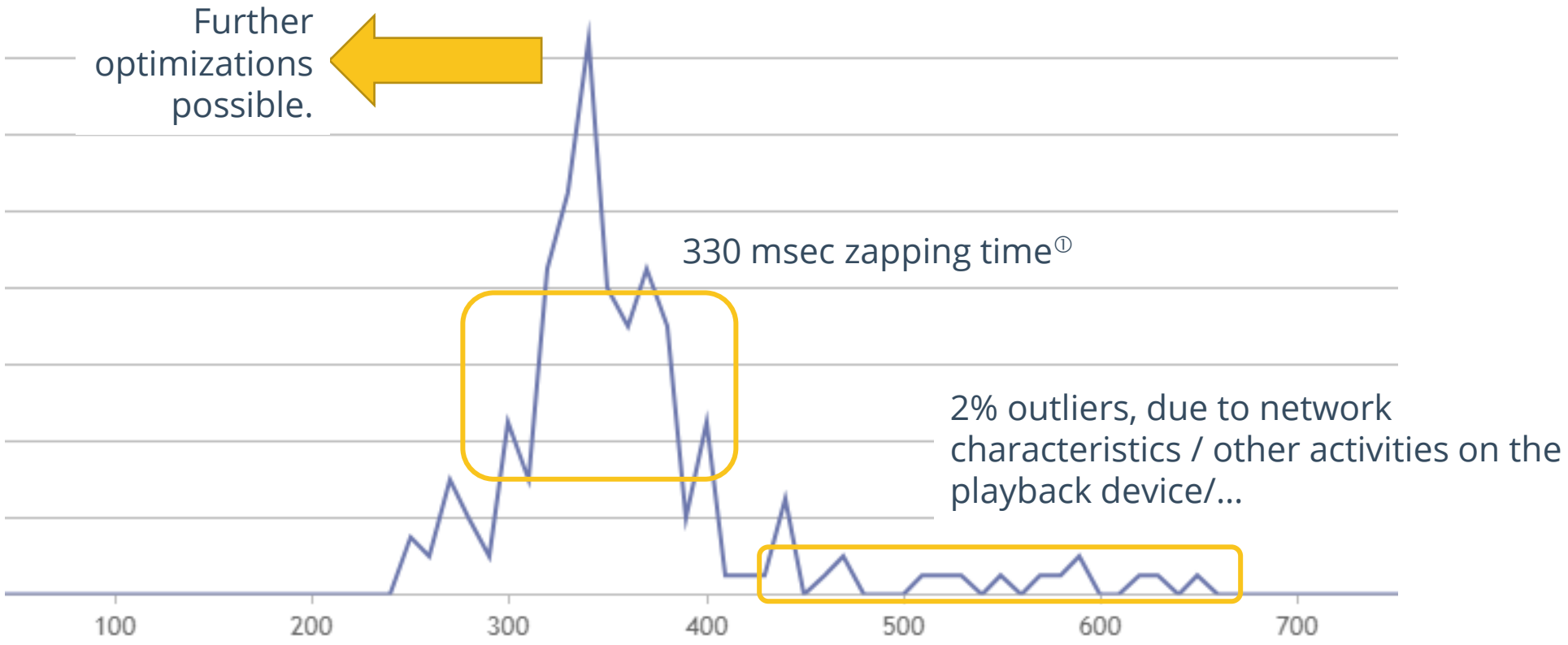
THE TRIAL IN ACTION



Control bar for the video (mute/full-screen/…)

Control buttons to pause / play / change channel (with keys for full-screen video)

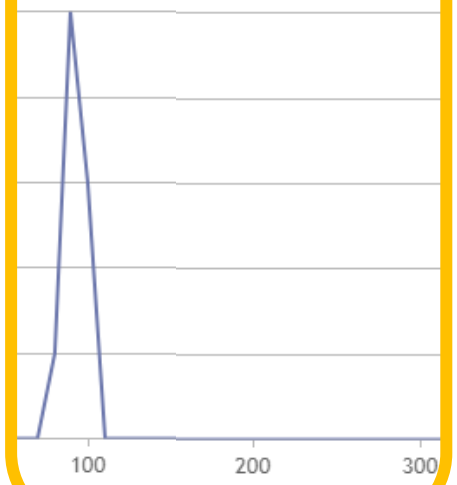
ZAPPING TIME RESULTS - LIGHTNING FAST



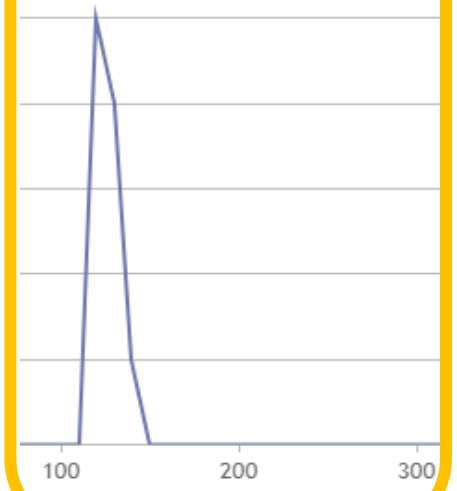
① Dependent on network, bitrate, ...

ZAPPING TIME RESULTS - SLOWER NETWORKS ARE PENALIZED

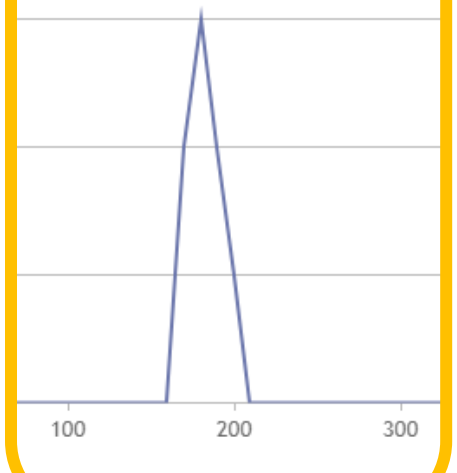
Office network



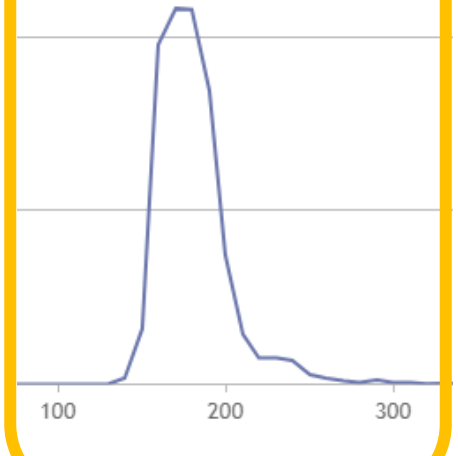
Wired network



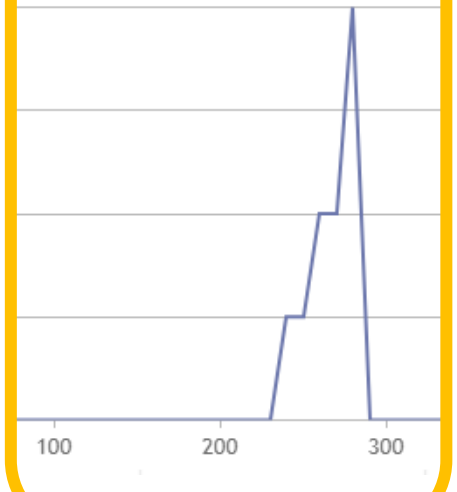
Cellular network



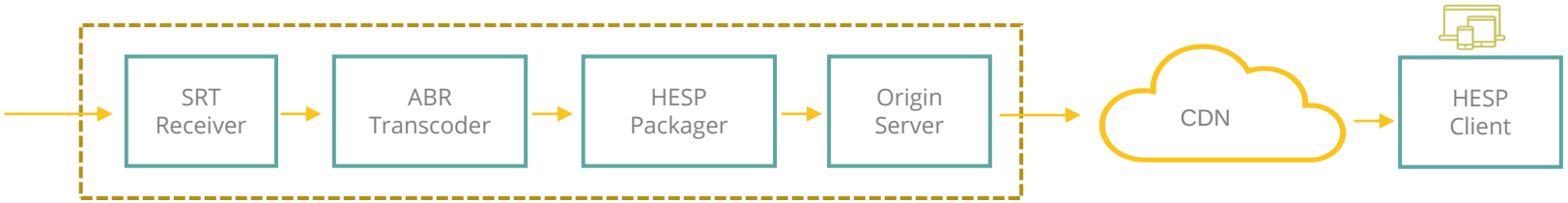
Network jitter



Longer distance



LATENCY RESULTS

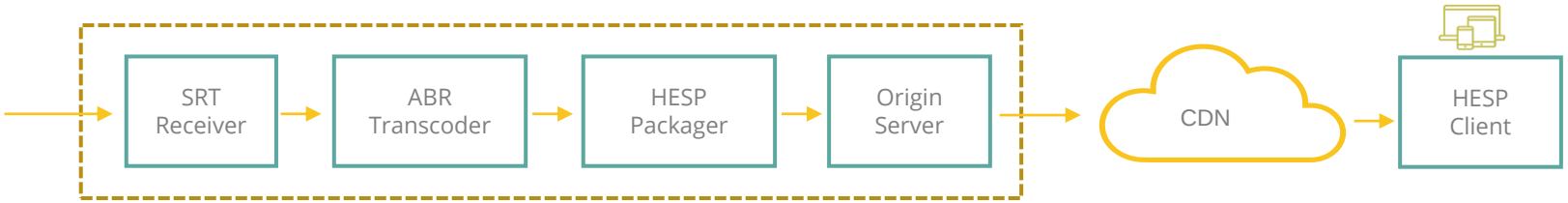


Protocol latency

0,4 – 0,7 sec

(important to ensure
timely delivery with traditional broadcast feeds)

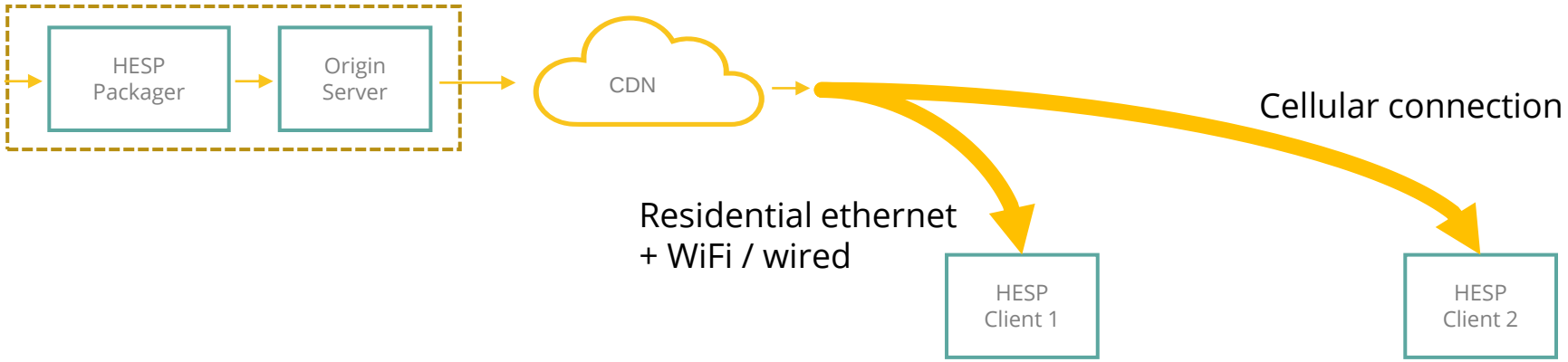
LATENCY RESULTS



Glass-to-glass latency

For live events applications this can go down to 0.5 – 1 second depending on encoding quality tradeoffs (or below for good networks)

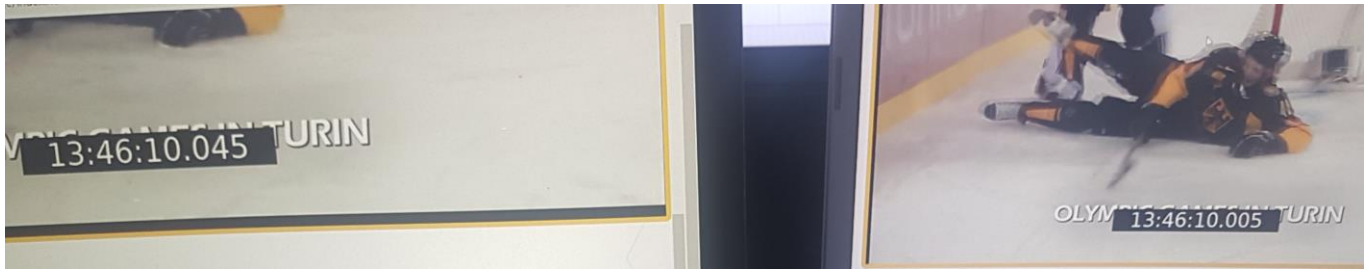
SYNCHRONOUS DELIVERY RESULTS (1/2)



Synchronous +/– 1 frame

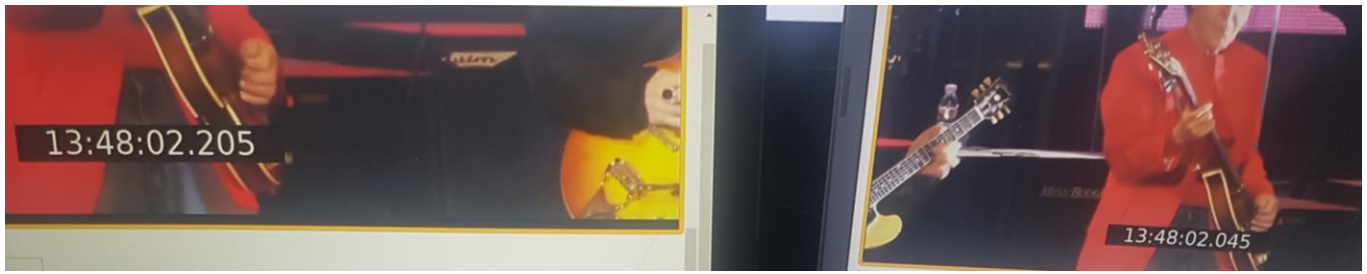
SYNCHRONOUS DELIVERY RESULTS (2/2)

500 msec
(protocol) latency



Synchronization
within 1 frame

300 msec
(protocol) latency



Synchronization
within 4 frames

CONCLUSION

- Operator Grade Leanback TV Experience with OTT Streaming is possible today.
- The HESP protocol is a key element to bring ultra-low latency, fast zapping at scale.
- A trial setup with THEO, Synamedia, Fastly is available for testing.
- Test results are very promising with sub second latencies and zapping times in real network conditions.

QUESTIONS?

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https://www.synamedia.com/about/#contact

https://www.fastly.com/contact-us

https://www.hespalliance.org

www.theoplayer.com