



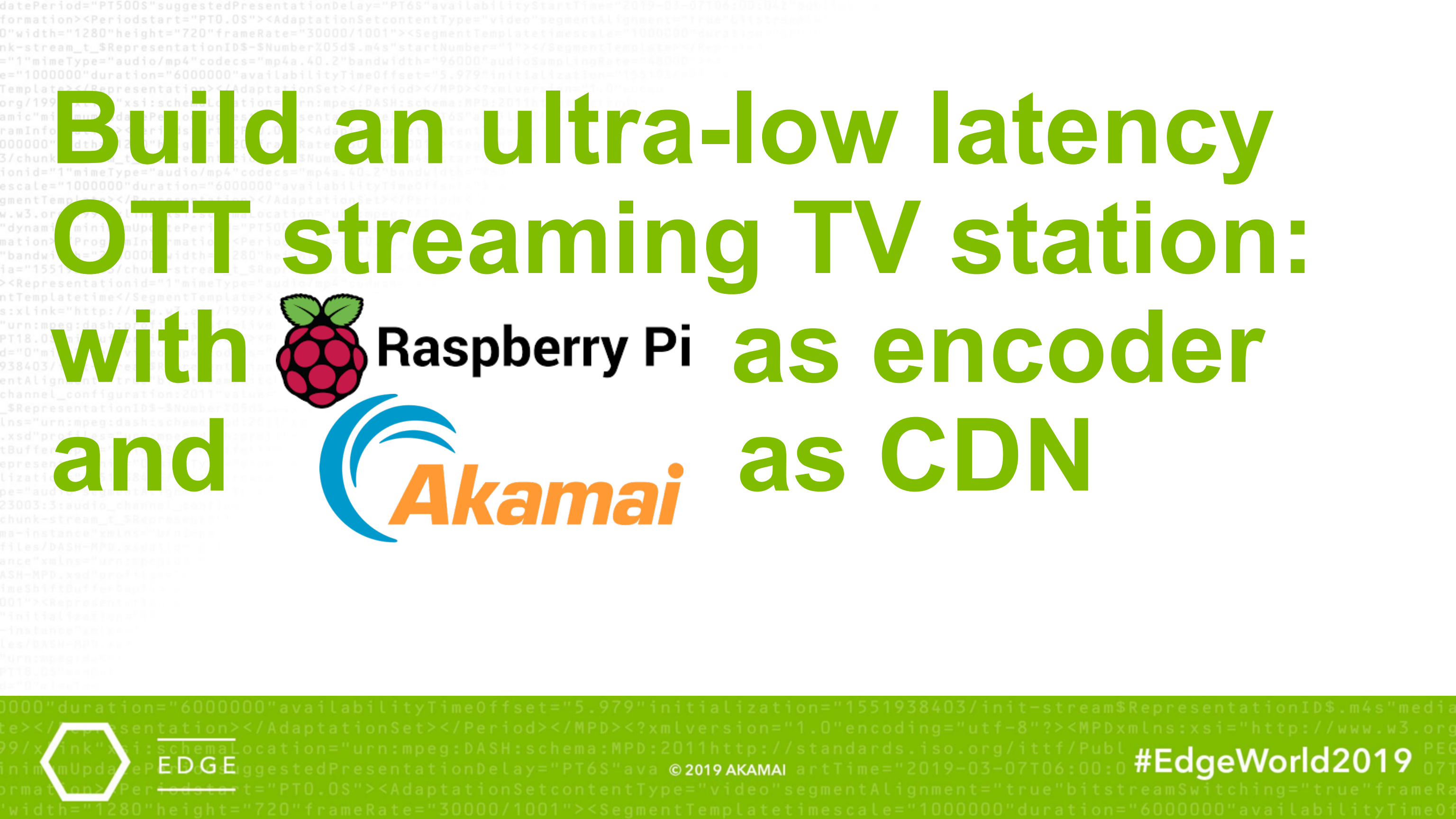
# EDGE/WORLD

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EXPERIENCE THE EDGE

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# Build an ultra-low latency OTT streaming TV station: with Raspberry Pi as encoder and Akamai as CDN



Raspberry Pi



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#EdgeWorld2019

# Global Consulting Services



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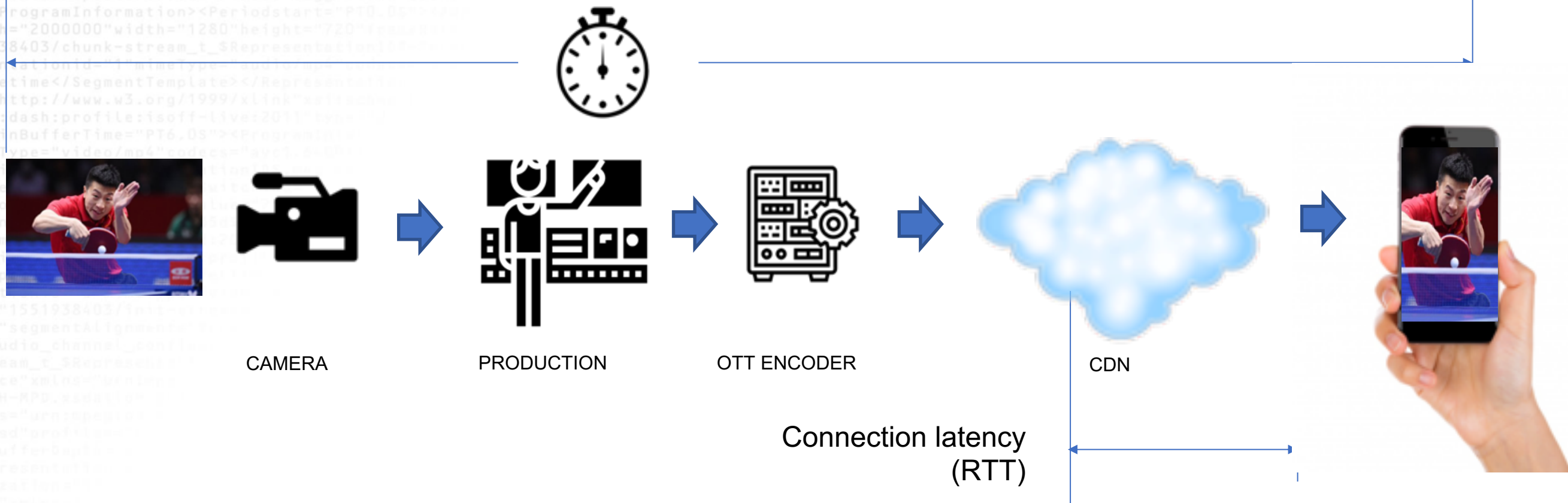
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# Live stream latency

Live stream latency = end-to-end latency = glass-to-glass latency = hand-waving latency



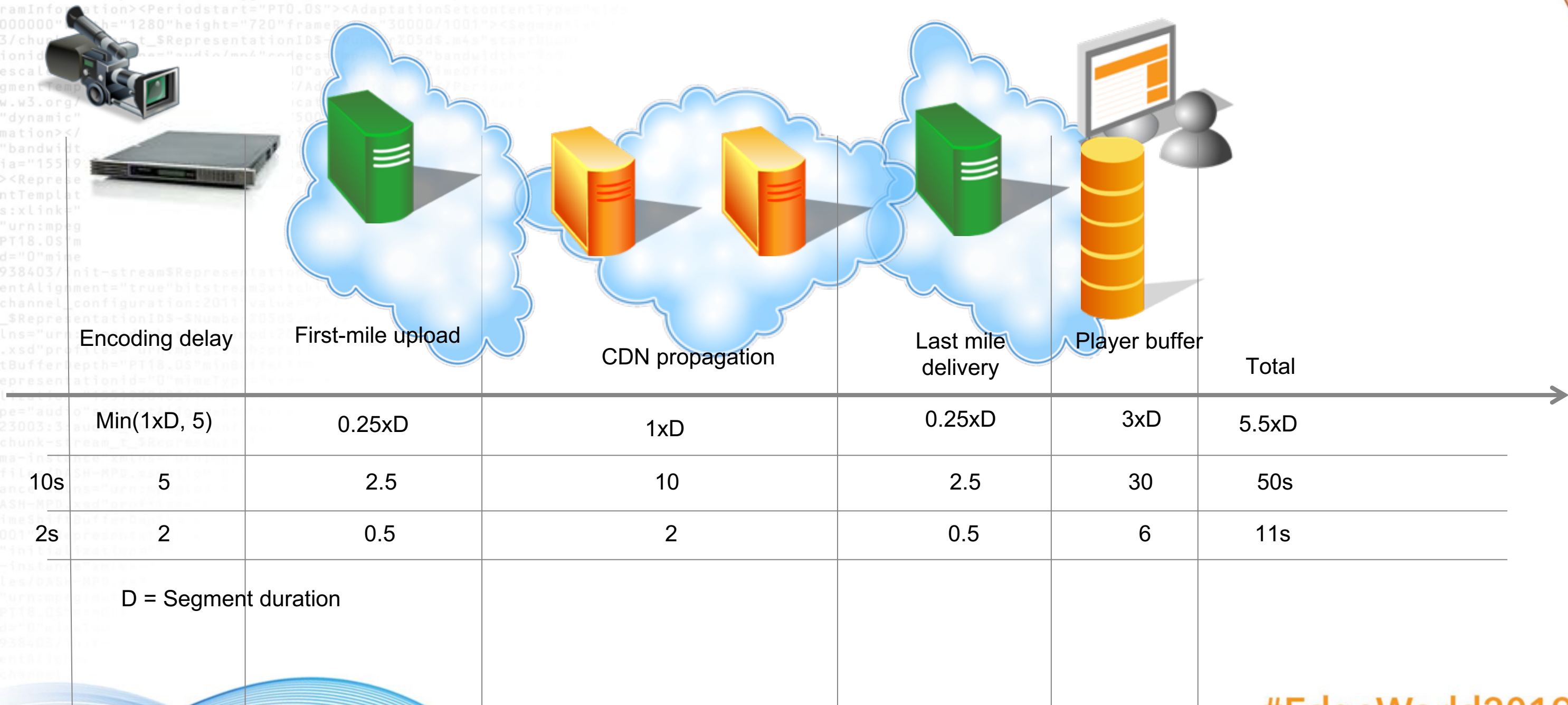


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# Components of latency in live stream segmented media delivery





# Super Bowl 2019: Measured Lag Behind Real-Time

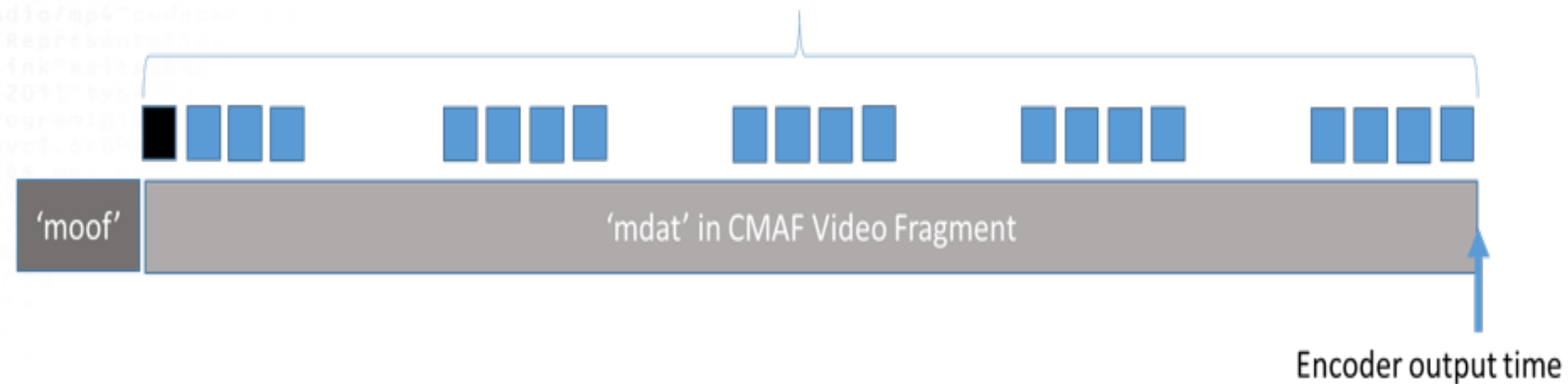
Comparing various streaming sources with the on-field game



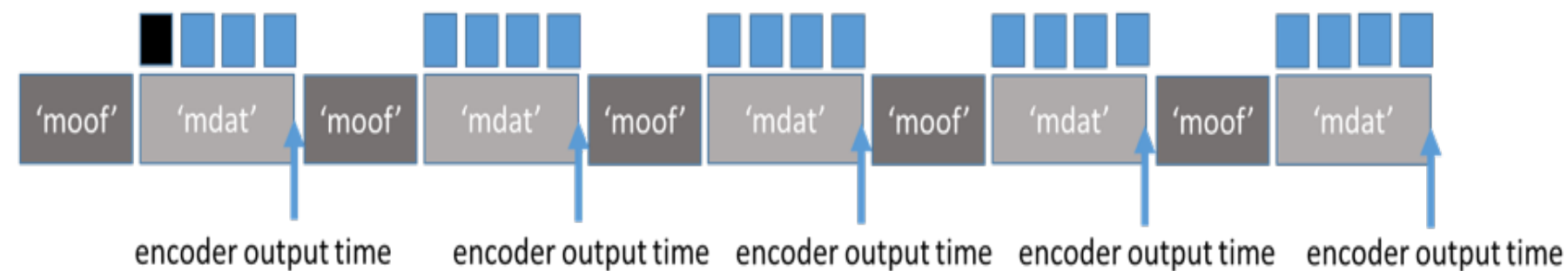
Conclusion: Viewers on all platforms are significantly delayed, leading to spoilers and a degraded user experience.

# CMAF Low Latency Chunks

Example: CMAF Fragment containing a Coded Video Sequence of 20 samples



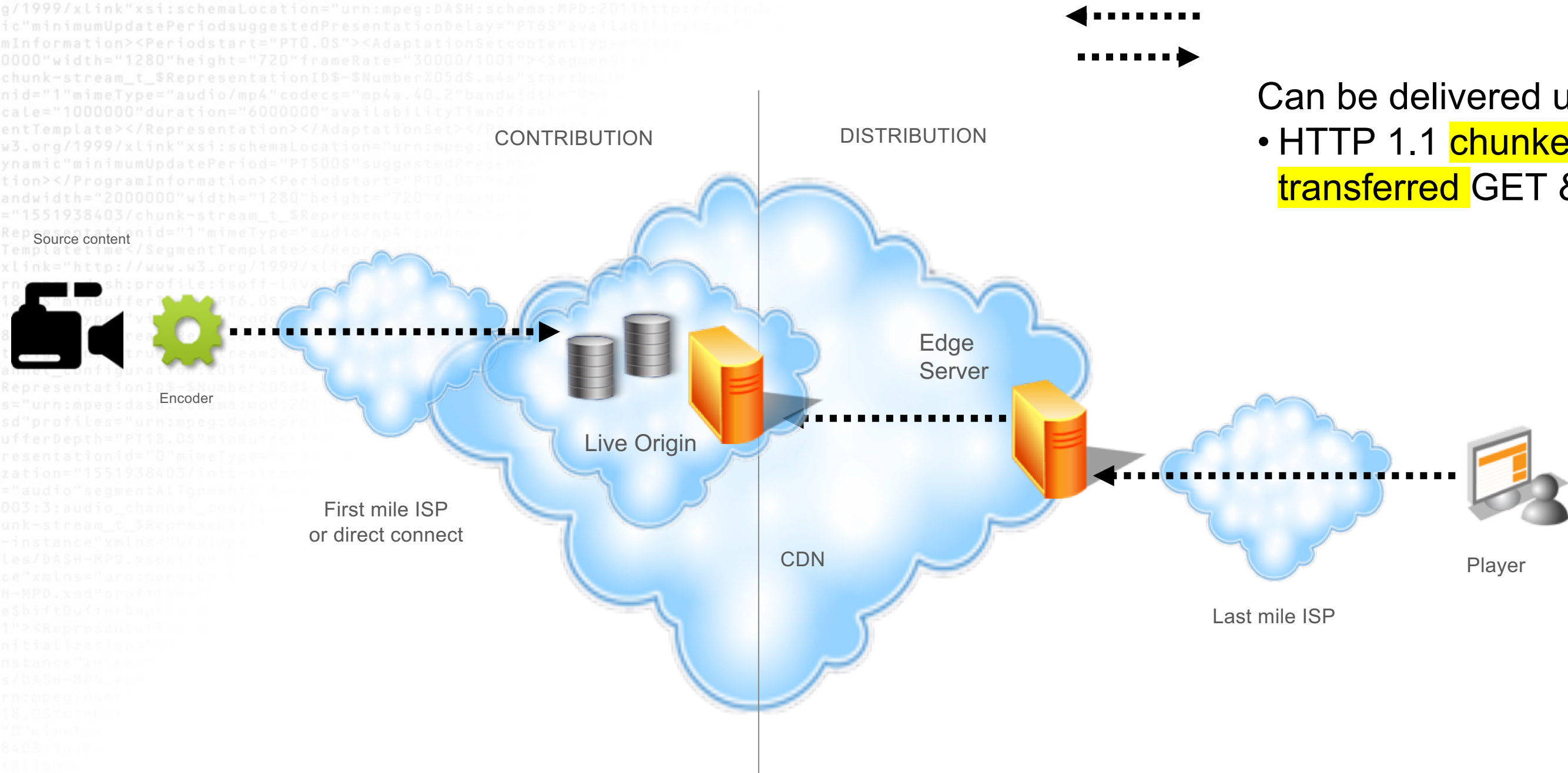
Same media samples packaged in CMAF Chunks for low latency encode and transfer



*[Image credit deep inside MPEG somewhere, possibly Kilroy Hughes]*



# Distribution Architecture



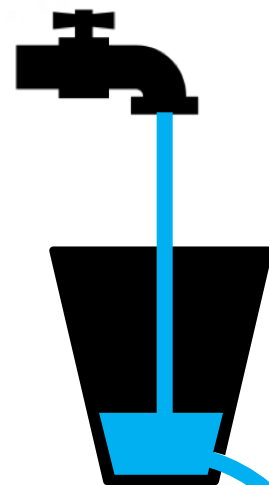
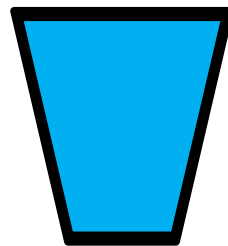
Can be delivered using:

- HTTP 1.1 **chunked transferred** GET & POST

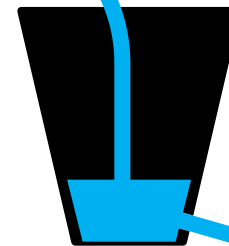
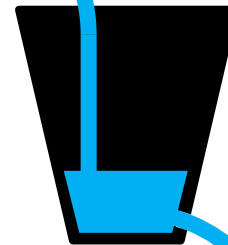
# Bucket analogy for chunked encoding and transfer



Non-chunked  
encoding and  
delivery

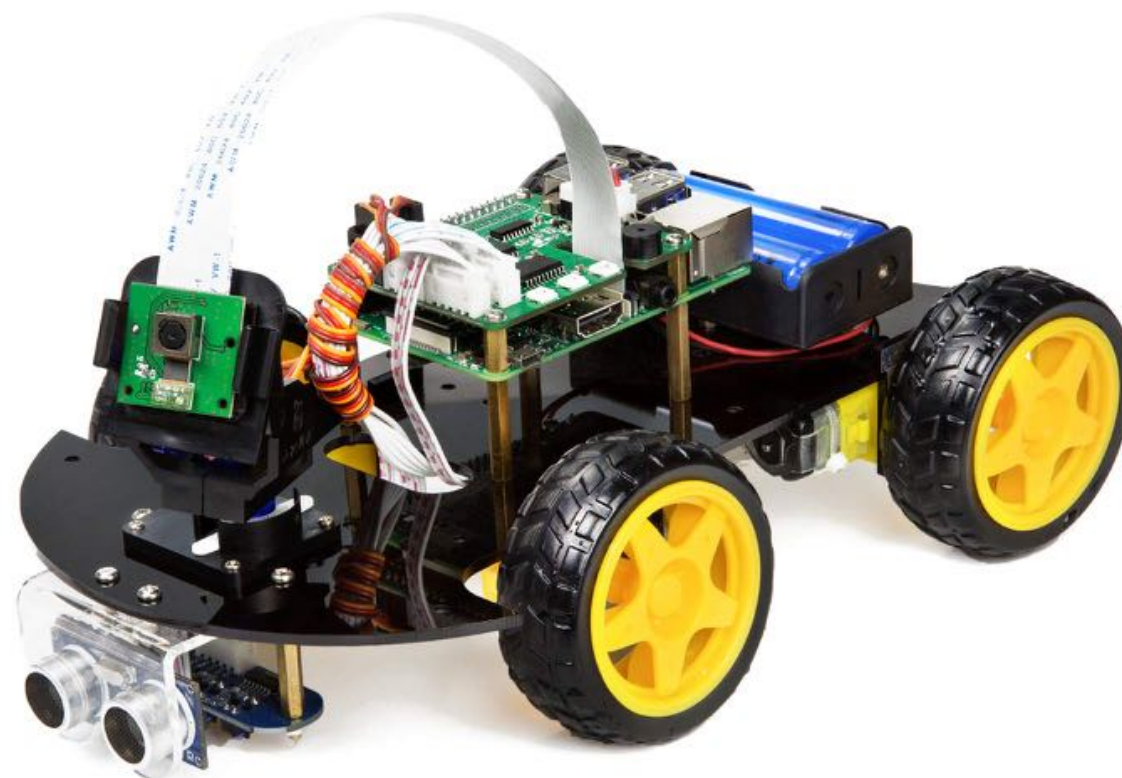


Chunked encoding  
and delivery





# Live demo



# Executive Summary

- ✓ Audience wants the epic moment in no time.
- ✓ Keeping shortening segment duration isn't a sustainable approach.
- ✓ You don't need a supercomputer as your video encoder.
- ✓ Chunk-encoded-chunk-transfer can achieve 3 sec end-to-end latency!





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THANK YOU

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