

Introduction: Optimizing Content Delivery

BY JACLYN PYTLARZ

Welcome SMPTE readers to our final technical paper issue of the 2024 season. We are wrapping this year up with a mixed issue. Most of our technical papers will cover improvements and proposals for ultra-low latency encoding and live-streaming applications. Our two off-topic papers on this issue will cover new HDR/SDR dynamic conversion methods with metadata and in-camera visual effects improvements utilizing SMPTE ST 2110. Here's a brief snippet for each of the papers you'll find in this issue:

“Live Sports Streaming with Prioritized Media Over-QUIC Transport:” This paper explores the innovations in streaming prioritization. The authors present experimental results on latency for frame-type-based (I-frame, B-frame, P-frame) prioritization and show how the same on-time display ratio can be achieved with lower latency budgets if we apply a better prioritization scheme.

“Enhancing Live Event Production with SDR/HDR Conversion Compatibility and Stable Graphics Management: A Metadata-Driven Approach:” This paper recommends a new SDR/HDR tone mapping method. It shows how a dynamic methodology can produce higher

image quality results and proposes metadata to define the tone mapping curve for improved interoperability. In addition, it outlines a tone mapping adjustment that could help achieve more stable graphics when doing a dynamic down-conversion.

“Ultra-Low Latency OTT Delivery: The Killer Technology for Betting, Social Networking, and Metaverse:” This paper explores the landscape of ultra-low latency streaming for over-the-top (OTT) live applications. It includes a solid introduction to methodologies in practice today. In addition, the authors propose a method to reduce encoder-to-play-out latency down to 1.7 seconds using encoder, packager, and network optimizations.

“Using Single-Pass Look-Ahead in Modern Codecs for Optimized Transcoding Deployment:” This

paper evaluates the performance and quality impacts of using production-ready single pass encoders for video-on-demand use cases. It aims to show how this single-pass workflow can significantly decrease transcoding time and complexity while maintaining high perceptual quality.

“Cloud-Based Internet Linear Video Delivery System Using Edge Computing on CDN:” This paper proposes a cloud-based HTTP adaptive-streaming workflow that uses edge computing within the content delivery network (CDN) to facilitate prompt schedule changes. The authors show how this methodology can improve latency and complexity for live-linear streaming to deliver localized and personalized channels.

“Enhancements to Media Transport in ICVFX using SMPTE 2110:”

This paper provides a thorough proposal including experimental results for utilizing SMPTE 2110 in the clustered rendering pipeline for in-camera visual effects. The authors show how 2110 can be used to multi-cast multiple camera views to the render nodes and how the final pixels can be output to synchronously drive each section of the LED walls used on set.

I hope you thoroughly enjoy this issue of the SMPTE *Motion Imaging Journal*. As always, happy reading!

About the Author



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