Whitepaper

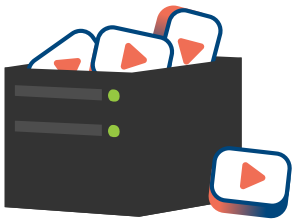
OPTIMIZED VIDEO ENCODING FOR COST SAVINGS AND ENHANCED EXPERIENCE

Video encoding optimization for streaming platforms using VisualOn and Axinom Encoding

VisualOn

axinom!

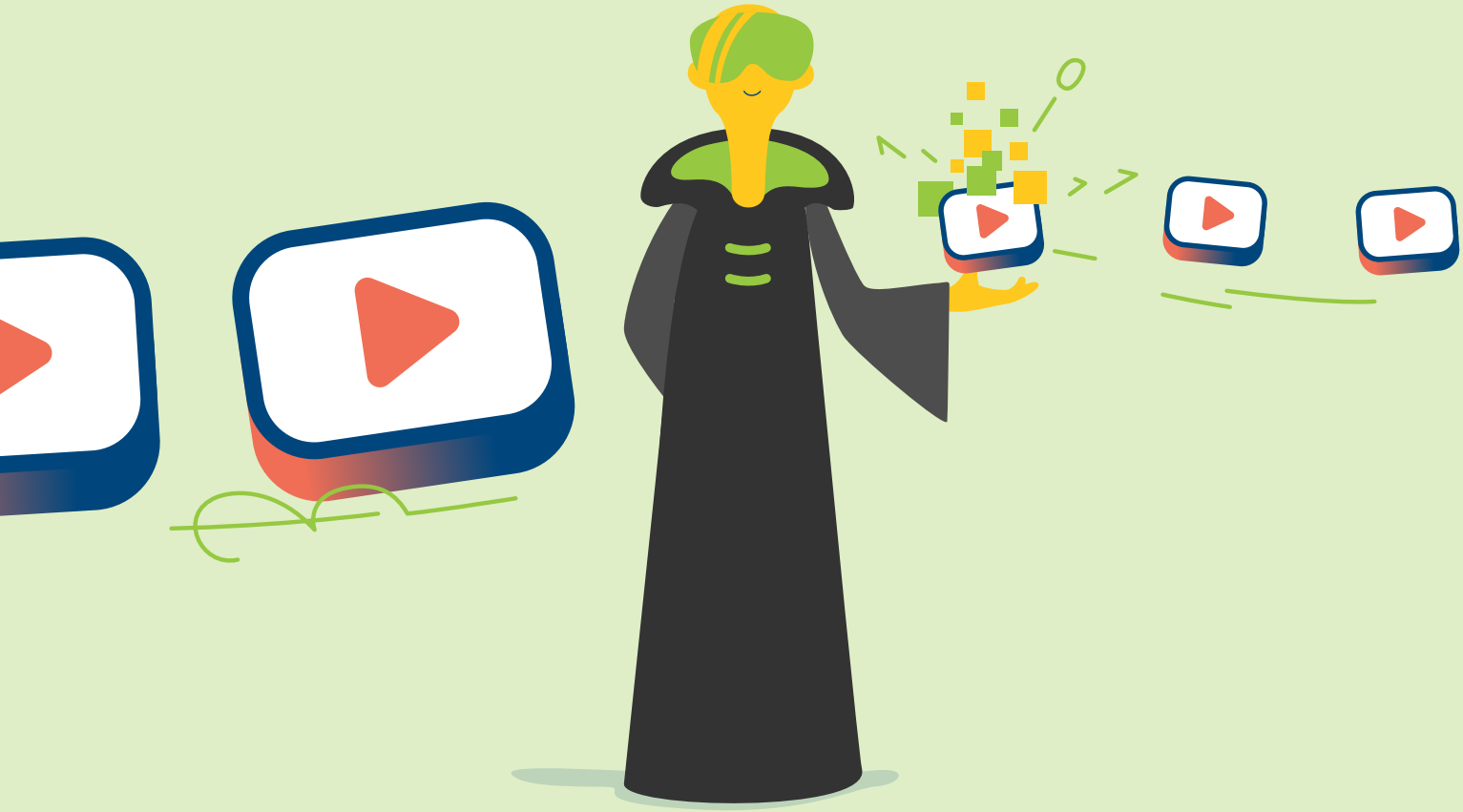
CONTENT



SUMMARY

In the streaming industry, encoding encompasses all the processes that are involved in the creation of VoD content from various sources. Going beyond file compression, encoding is a key activity that affects buffering times, image quality, and even data costs. Optimized videos load faster with less buffering, which leads to a better viewer experience. In addition, video optimization saves data transfer and streaming costs since it requires less bandwidth. Optimized content is also compatible with a wider range of devices and platforms, which results in increased reach and engagement.

This whitepaper focuses on the latest compression technology for video encoding. By choosing to transcode content with VisualOn Optimizer, Axinom Encoding clients will see significant savings across different content types while maintaining or improving image quality.



THE CRITICAL ROLE OF CODECS IN THE STREAMING INDUSTRY

The workflow of a streaming platform includes delivering content to a variety of devices including browsers, mobile phones, tablets, and Smart TV. This requires platforms to encode their media employing a variety of codecs. But why?

The ultimate goal of streaming platforms is to offer a pleasant watching experience, no matter the device. While more recent codecs improve image quality and are more efficient, legacy codecs allow platforms to deliver media to users watching on outdated devices.

Axinom Encoding is a simple HTTP-based API that creates video-on-demand (VOD) content from various source formats. This easy-to-use service has powerful video transcoding capabilities, which now include the option to use VisualOn Optimizer.

KEY FEATURES AND ADVANTAGES OF AXINOM ENCODING

- Support for many formats of source video, audio, and subtitles. **See full list here.**
- H.264 (AVC), H.265 (HEVC), and AAC codecs.
- DASH, HLS, and CMAF packaging for adaptive streaming.
- Ability to publish to many different file storage solutions, such as FTPS, Amazon S3, or Azure Blob Storage.
- DRM protection using Widevine, PlayReady, and FairPlay.
- Direct integration with Axinom DRM.

KEY FEATURES AND ADVANTAGES OF VISUALON OPTIMIZER

- Significant bitrate reduction while maintaining comparable video quality (as measured by VMAF scores).
- Flexibly configured to achieve different desired trade-offs.
- Supports any compression standard including H.264 and HEVC.
- Works with any SW or HW encoder.
- Supports both VOD and Live content workflows, with no additional latency while Live streaming.
- Reduces CPU consumption in VOD workflows by using single pass encoding.
- Produces media that is fully standard-compliant without any playback compatibility issues.

INTRODUCTION TO THE ENCODING WORKFLOW

Axinom Encoding executes jobs asynchronously, and it involves several distinct phases.

PRE-VALIDATION
Validation of the job description and the credentials for the external storages.

↓

ACQUISITION
Download of the content from the input storage to a temporary storage for the next operations.

↓

MEDIA MAPPING
Identification of the video stream, audio, and subtitles files.

↓

ENCODING
Video and audio encoding according to the selected settings.

→

VISUALON OPTIMIZER
If selected, this processes video with VisualOn Optimizer.

↓

DRM PROTECTION
Encryption of the content according to the supplied settings (this is optional).

↓

PACKAGING
Packaging of the encoded video, audio, and subtitles.

↓

IMAGE EXTRACTION
Extraction of frames from the video, which are then saved as JPEG images and thumbnails in a specified location.

↓

PUBLISHING
Publication of the processed content to the specified output storage.

It is important to know that some of these processing steps happen simultaneously, such as encryption and packaging.

MORE THAN A TECHNICAL SOLUTION, THIS IS A SMARTER WAY TO DO VIDEO ENCODING

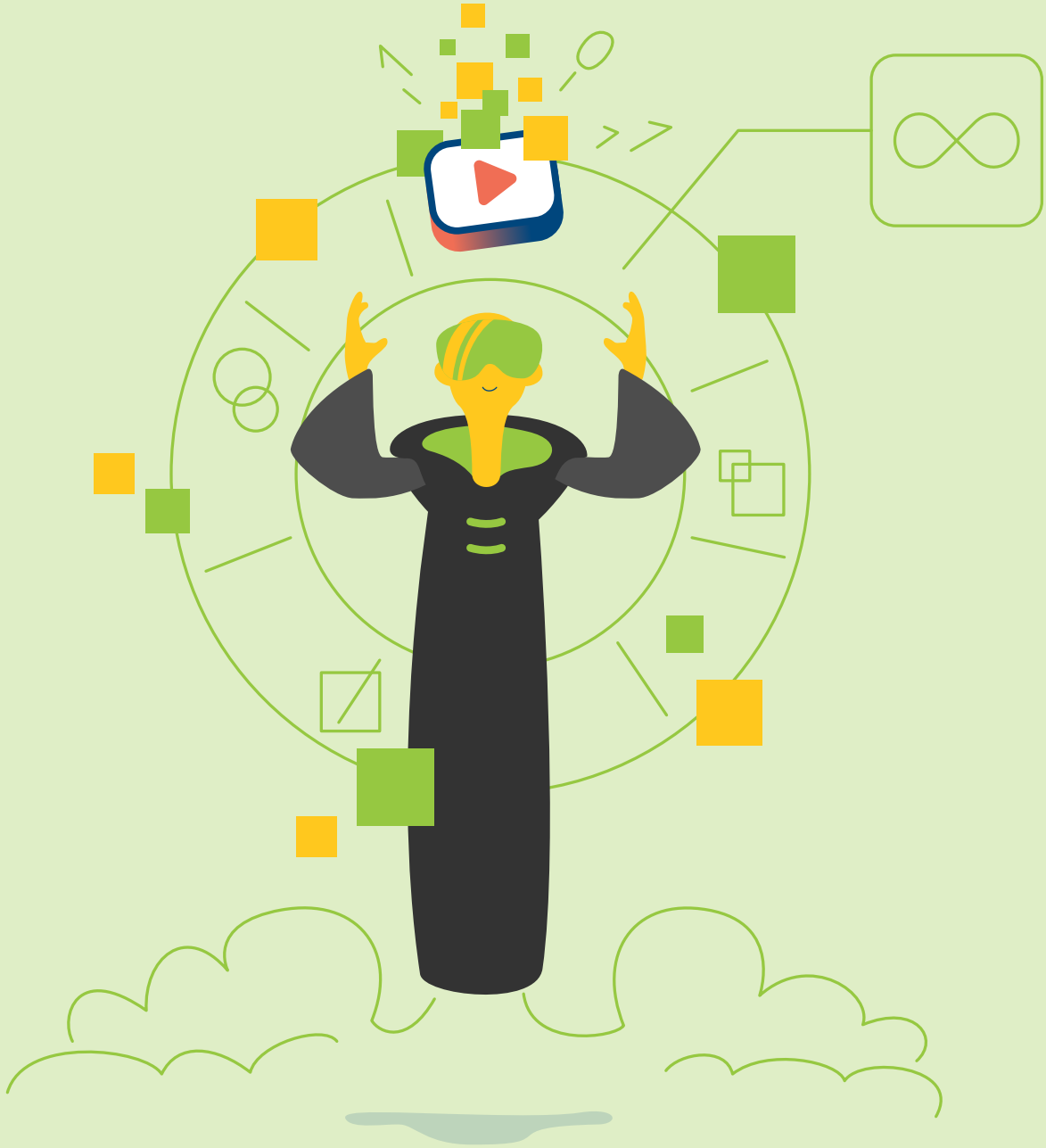
While user demand for better video quality has increased with the adoption of high-framerate video, the cost of bandwidth, CDN transfers, and storage have also increased for OTT companies. In the current competitive market, saving costs in encoding can help platforms to maximize profits.

BENEFITS FOR OTT COMPANIES

- Higher encoding efficiency.
- Reduced data storage costs.
- Reduced CDN transfer costs.
- Greener and more sustainable workflow.

BENEFITS FOR END USERS

- Better image quality.
- Less buffering time.
- Uniform viewing experience across devices.



KEY FIGURES

In this section, learn how optimized encoding can build a more efficient digital workflow with less demand for storage and reduced operational costs.

HOW VISUALON OPTIMIZER HELPS TO SAVE STREAMING COSTS AND INCREASE QOE

VisualOn Optimizer is a patent-pending production-proven per-scene transcoding technology that analyzes the input content to optimally configure the encoder to achieve the best trade-off between visual quality and bitrate. Integration with existing encoder workflows is straightforward, as shown below. VisualOn Optimizer works before or in parallel with the encoder for optimal results.

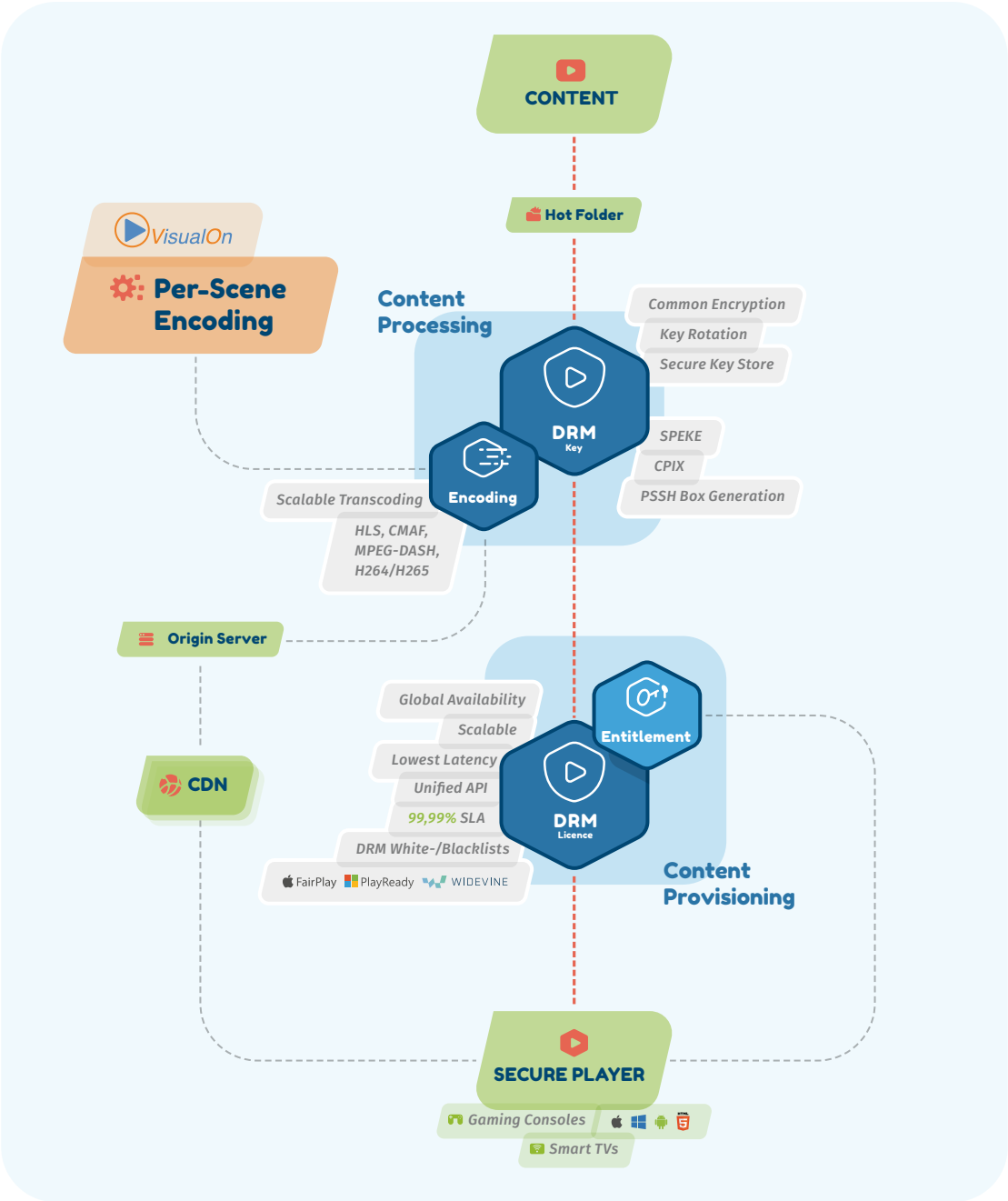


Figure 1. Digital workflow of VisualOn Optimizer and Axinom Encoding

DATA BENCHMARKS OF MEDIA ENCODED WITH VISUALON OPTIMIZER

Figure 2 shows the results of encoding VOD media with and without VisualOn Optimizer. With single-pass encoding, VisualOn Optimizer cuts the bitrates in half while maintaining similar or better visual quality. It also reduces CPU consumption compared to the dual-pass encoding without VisualOn Optimizer.

		FFmpeg kbps	Optimizer kbps	Saving %
HD	HEVC	3509	2242	**36**
		2012	1027	**49**
		1214	636	**48**
		814	461	**43**
		365	243	**33**
	AVC	3001	1308	**56**
		1802	792	**56**
		1302	585	**55**
		602	310	**49**
		382	207	**46**
UHD	HEVC	11468	3819	**67**
		7979	3645	**54**
		4991	1802	**64**
		3496	1688	**52**
		2002	942	**53**
		1207	587	**51**
		810	454	**44**
		362	246	**32**

Avg. Saving 49%

Figure 2. Comparison of VOD media encoded with FFmpeg dual-pass versus VisualOn Optimizer

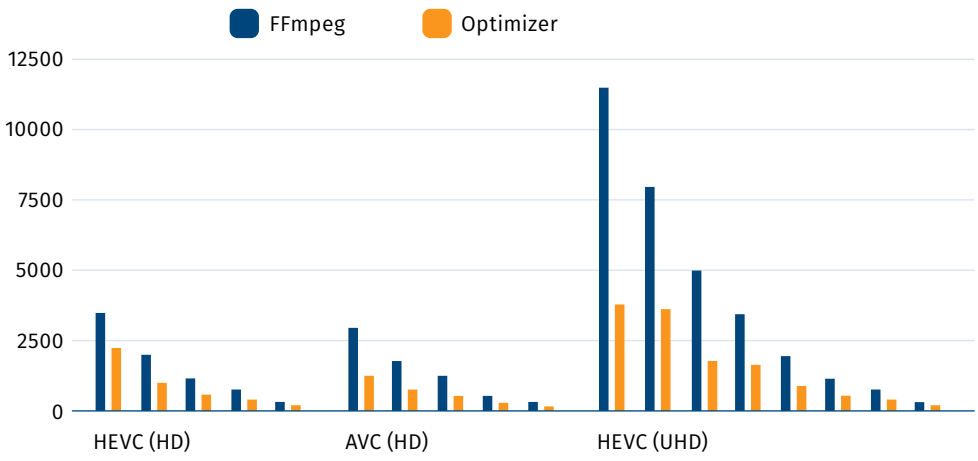


Figure 3 shows how LIVE content that is processed using optimized encoding observes significant savings for both average and peak bitrate with consistently better visual quality, without introducing additional latency.

		FFmpeg			Optimizer				
Source	Output	Avg. kbps	Peak kbps	VMAF	Avg. kbps	Saving %	Peak kbps	Saving %	VMAF
Documentary	1920x1080 7Mbps	5867	8409	90.869	3061	**48**	4746	**44**	93.654
Sports		6277	8123	93.432	3868	**38**	5520	**32**	94.128
News		6611	8100	94.797	2514	**62**	5480	**32**	95.223
Series episode		6173	7447	93.692	2444	**60**	4827	**35**	98.602
Documentary		6217	7819	92.787	3787	**39**	5173	**34**	94.578
					Avg. Saving	**50%**		**35%**	

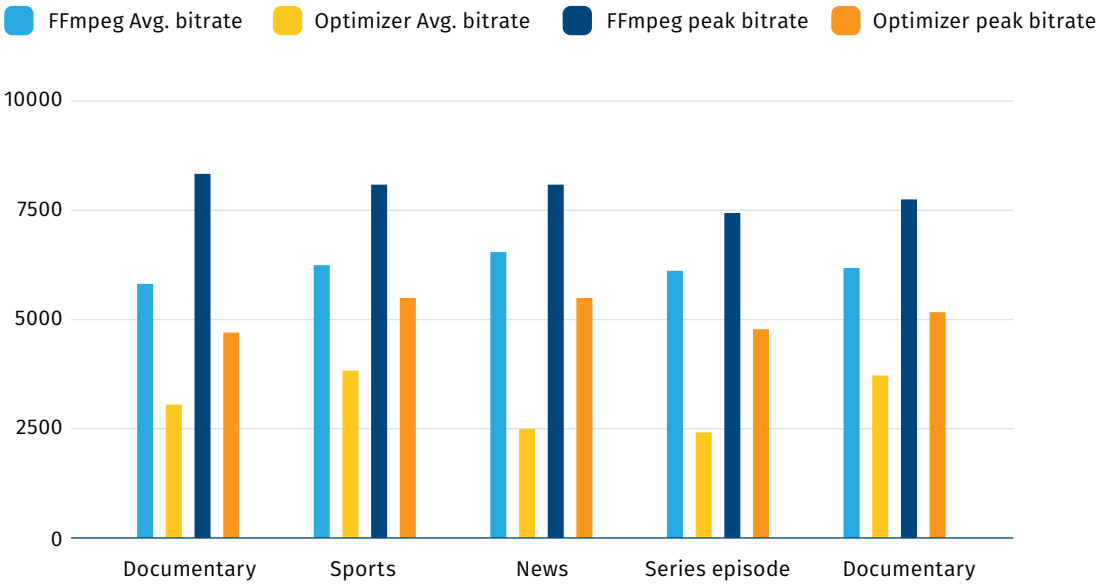


Figure 3. Comparison of Live media encoded with FFmpeg dual-pass versus VisualOn Optimizer

THE FUTURE OF ENCODING IS OPTIMIZATION

Axinom Encoding clients can now make their video processing more efficient, reduce operational costs, and offer a more sustainable service. Don’t miss out on the powerful capabilities of using VisualOn Optimizer, **contact us today!**

AXINOM ENCODING

Axinom Encoding is a service that secures the ingestion, transcoding, and encryption of video content. Built on Axinom Mosaic, it ensures seamless playback on multiple platforms and devices by using popular codecs (H264 and H265), adaptive streaming formats (HLS and MPEG-DASH), and the CMAF specification. Compatible with all storage and DRM services, Axinom Encoding protects premium video—including content from Hollywood studios—conforming to MPAA specifications.

Learn more at **axinom.com/products/encoding**

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VISUALON

VisualOn is a streaming solutions provider that optimizes the impact of the video player with years of providing playback innovation for Tier 1 streaming and telco providers worldwide. By optimizing player performance and quality of experience across all devices, VisualOn unlocks the ultimate viewing experience with its complete portfolio of player solutions and ahead-of-the curve playback features. The company's renowned customer service team deploys, optimizes and troubleshoots streaming video services to give customers a sustained competitive edge.

To learn more visit, **visualon.com**