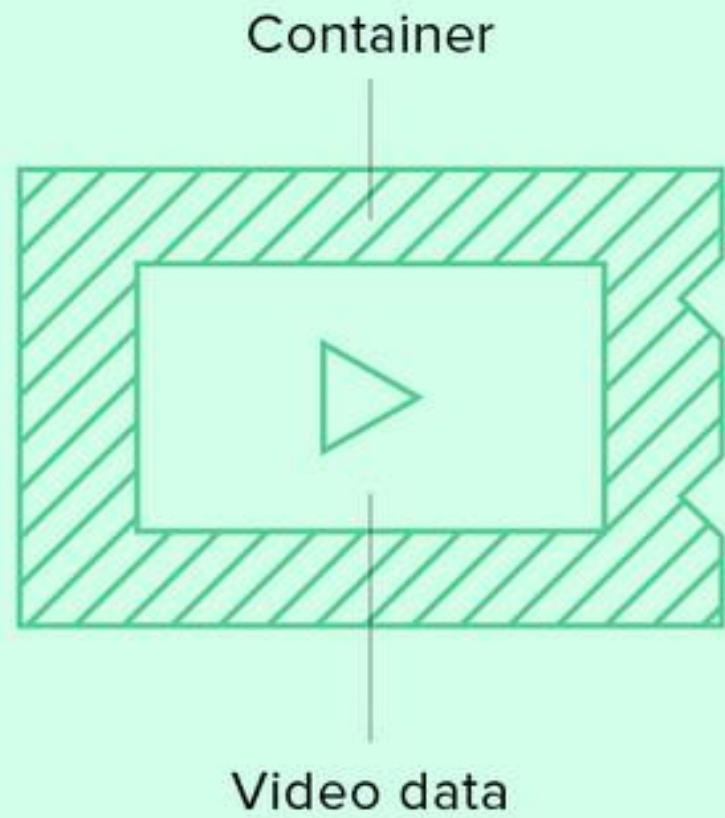




Streaming Video Codecs



→

**Video editing,
reading,
compressing
etc.**

←



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FORMATS, CODECS, & CONTAINERS



AV1 vs HEVC/H.265 - Which is the Codec of the Future?

Cost



Efficiency

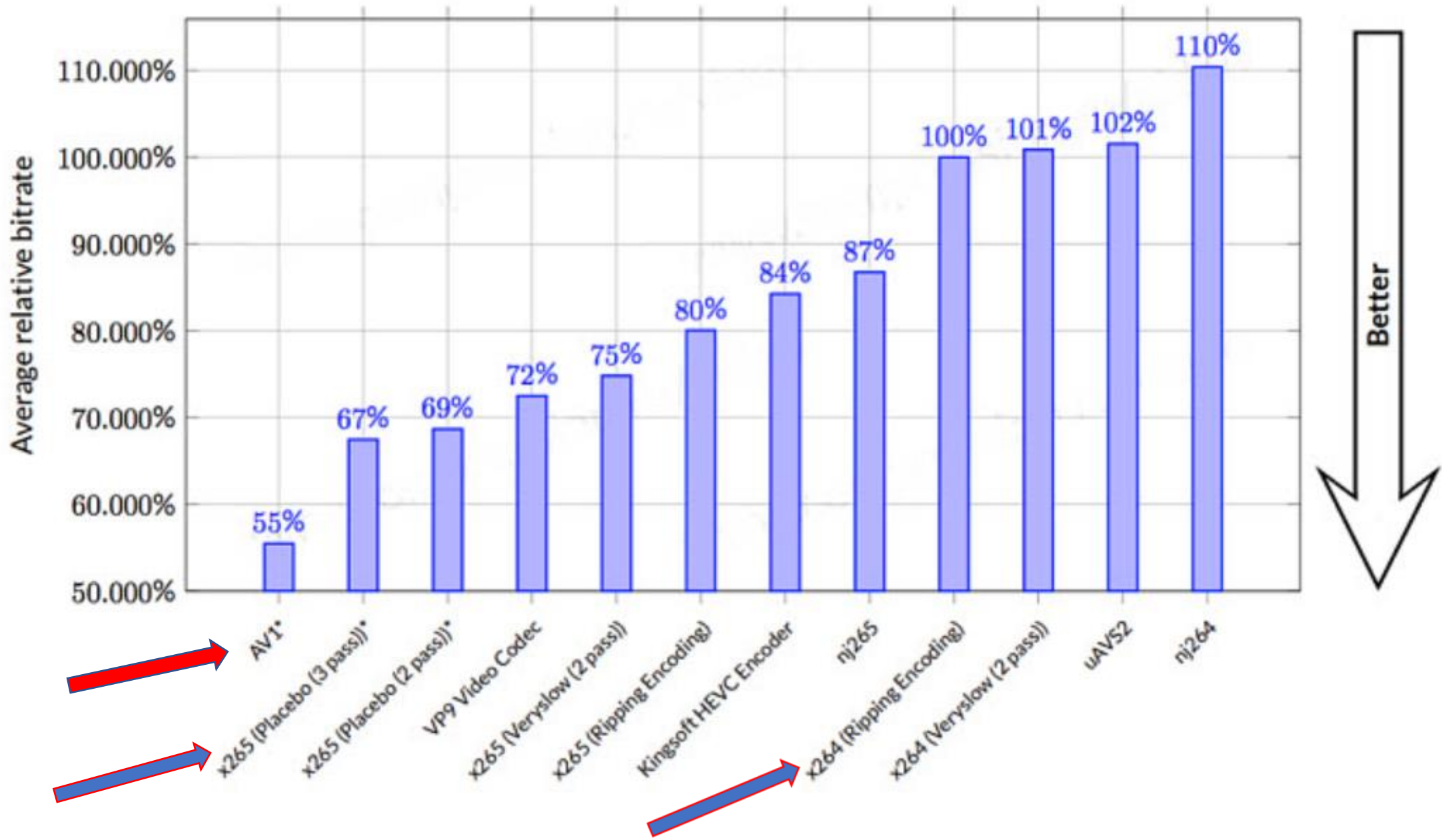


Quality



Codec	Licensor	Codec Royalties	Royalty Exemptions	Royalty Annual Cap	Content Distribution Fee
HEVC	MPEG LA	US\$0.20 per unit	First 100k units each year	US\$25 million	US\$0
	HEVC Advance	Region 1: <ul style="list-style-type: none"> ▪ US\$0.40 (mobile) ▪ US\$1.20 (4K TV) ▪ US\$0.20-0.80 (other) Region 2: <ul style="list-style-type: none"> ▪ US\$0.20 (mobile) ▪ US\$0.60 (4K TV) ▪ US\$0.20-0.40 (other) 	<ul style="list-style-type: none"> ▪ US\$25,000 each year ▪ Most software HEVC implementations distributed to consumer devices after first sale 	US\$40 million	Physical distribution: <ul style="list-style-type: none"> ▪ \$0.0225 per disc/title (Region 1) ▪ \$0.01125 per disc/title (Region 2) Non-physical distribution: <ul style="list-style-type: none"> ▪ US\$0
	Technicolor	tailor-made agreements	tailor-made agreements	tailor-made agreements	US\$0
	Velos Media	?	?	?	Presumed to charge royalty
	others (AT&T, Microsoft ...)	?	?	?	?
AV1	Alliance for Open Media	US\$0	N/A	N/A	US\$0

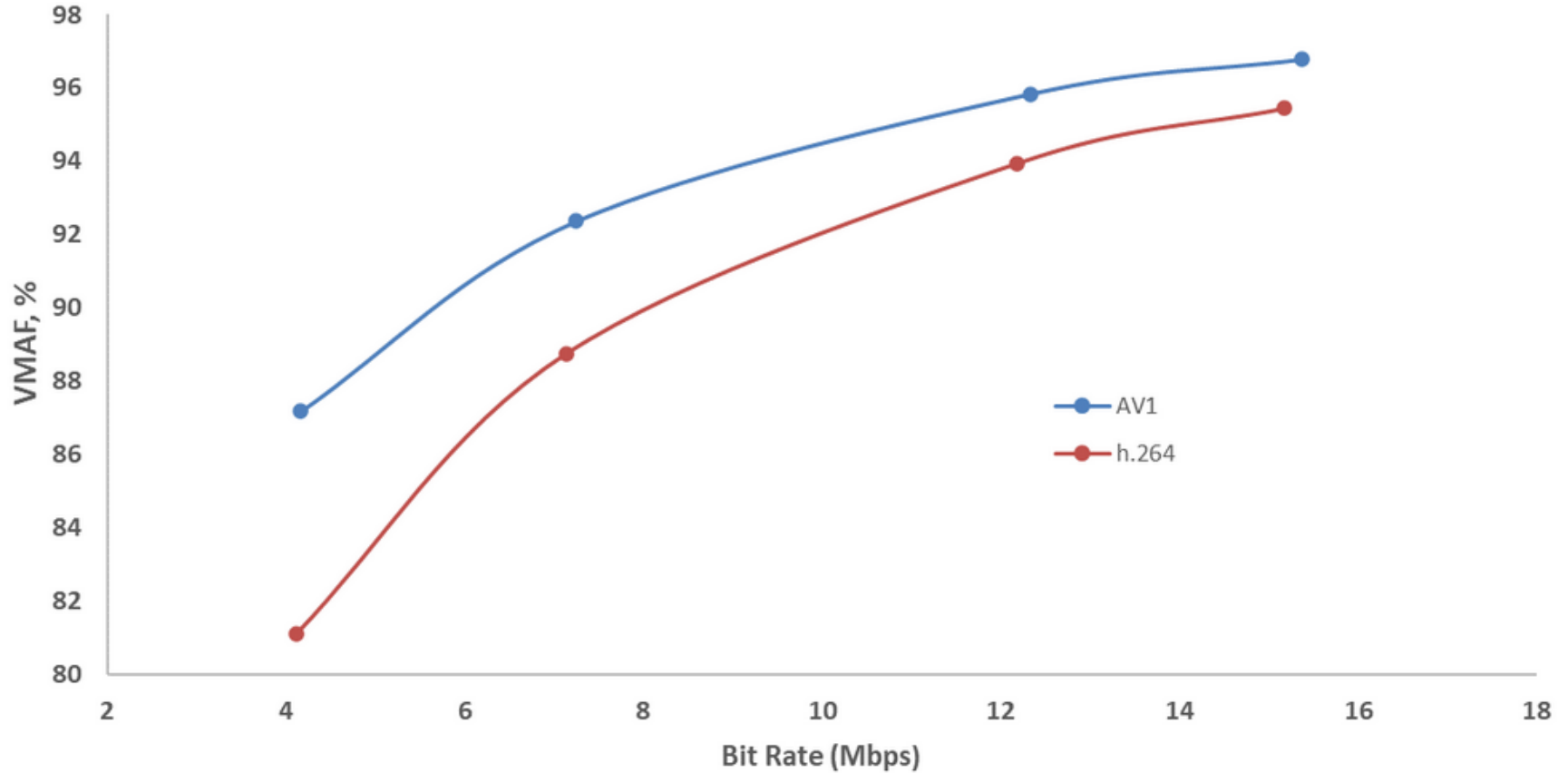
Costs



Compression Efficiency

Video Multimethod Assessment Fusion

1080p@60fps VMAF vs Bit Rate



About 85% + is considered acceptable to high quality

Increase in perceived video quality (VMAF) as bit rate rises for NVENC AV1 and NVENC H.264

Video Quality

Monday, November 7th 2022

FFmpeg Gets NVENC AV1 Encode Support for a 75-100% Encoding Speed Uplift Over HEVC

by btarunr | Nov 7th, 2022 15:44 | [Discuss \(10 Comments\)](#)

Popular video transcoding and playback software FFmpeg, in its latest update, received support for AV1 format hardware-accelerated encoding leveraging the NVENC AV1 hardware encoders on the latest NVIDIA GeForce RTX 40-series "Ada" GPUs. The author Timo Rothenpieler remarked that in his testing, the new NVENC AV1 encoder is outperforming the NVENC HEVC-based FFmpeg encoding by 75 to 100 percent, in terms of encoding speed, at comparable quality. When deployed at a data-center scale, or even a production studio-scale, accelerated AV1 encoding should have a tangible impact on costs, and not just because AV1 is a royalty-free format. NVENC AV1 encoding support was also recently added to OBS Studio, the popular free video streaming software.

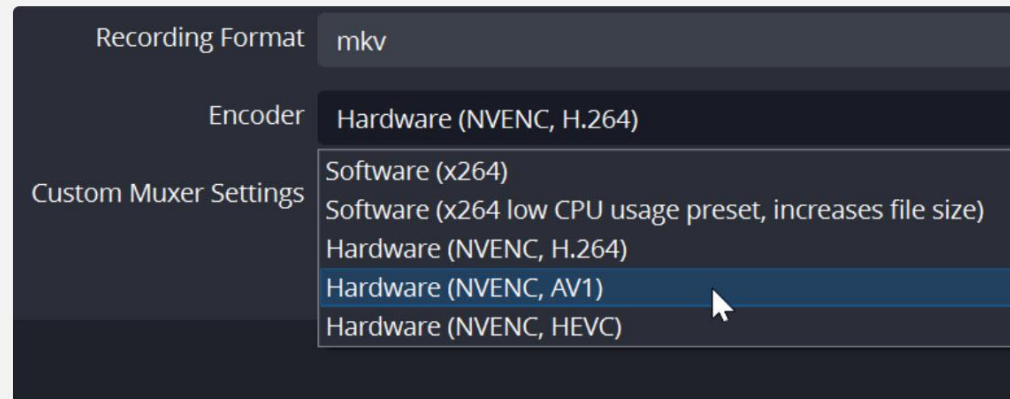
OBS studio with support for NVIDIA NVENC AV1

A popular streaming and recording software will now benefit from RTX 40 powerful AV1 encoding hardware.



The latest release of OBS brings support for AV1 recording with NVIDIA NVENC encoder on RTX 40 GPUs. The RTX 4090, the only model available which based on Ada architecture, has dual AV1 encoders. This is an eight generation NVENC encoder that officially provides twice as fast H.265 encoding and support for AV1.

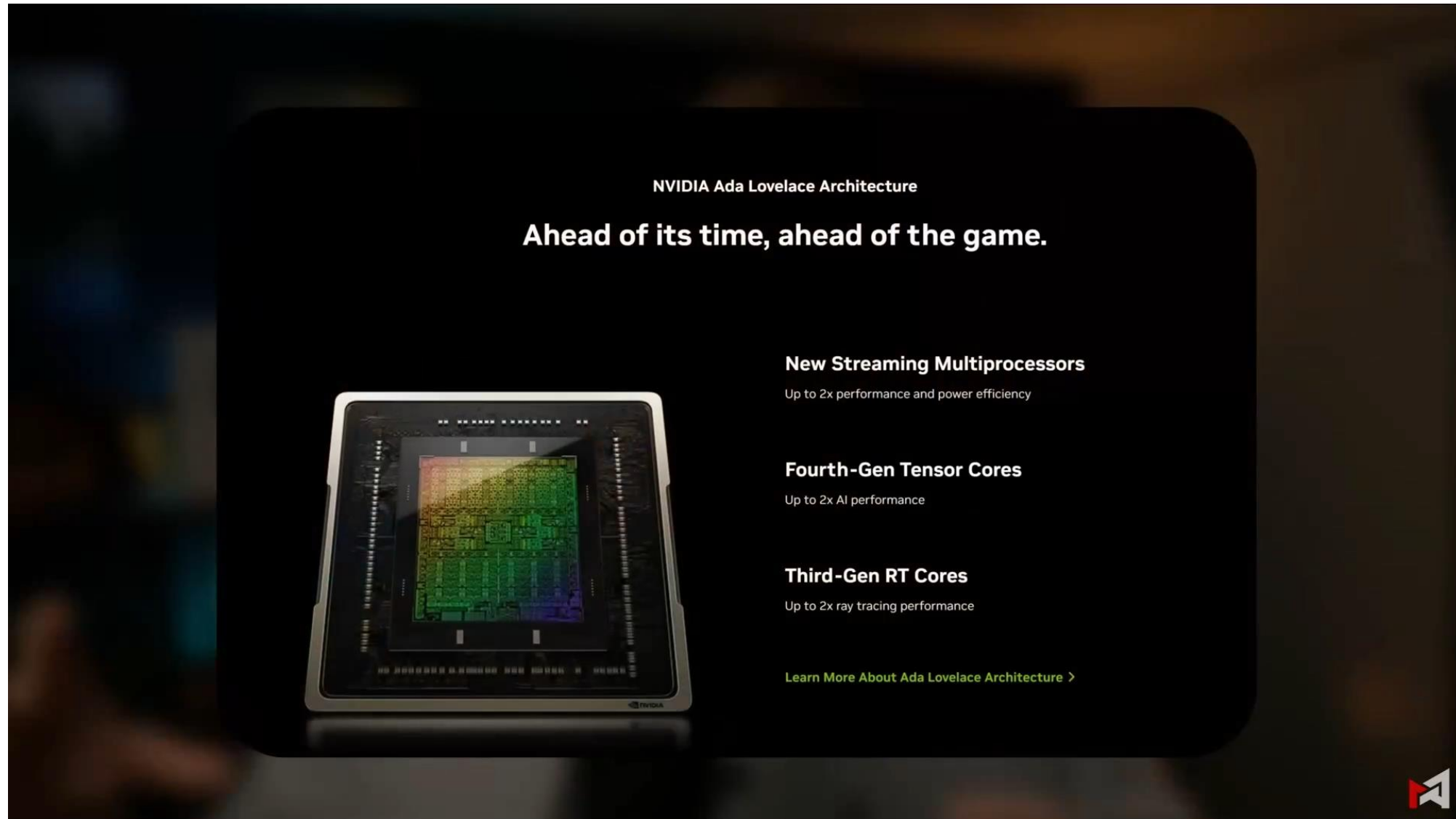
The AV1 encoding option now shows up for recording, but it is not yet available for streaming because no platform supports this format.



OBS 28.1 with NVENC AV1 encoder, Source: VideoCardz


The AV1 encoding currently only works with NV12 (8-bit, 4:2:0) and P010 (10-bit, 4:2:0) color modes. The AV1 encoding requires more powerful hardware than H.264 and H.265. The main advantage of AV1 encoding is no licensing fee, which is not the case with HEVC encoders.

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*Nvidia RTX 4080
AV1 Testing with Davinci Resolve - Performance*

Questions