NGCODEC

NEXT GENERATION VIDEO COMPRESSION

Economic value of better compression

twitch

Save Millions on your CDN Costs

HUAWEI

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NGCODEC

NEXT GENERATION VIDEO COMPRESSION

Ian Jefferson

- 20 Years' Video Delivery/Compression
- Senior/VP Sales and BusDev roles at IDT, Harmonic, Entone.

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Why use Xilinx with NGCodec?

NGCodec live VP9 & HEVC can reduce bitrate by 30% over x264 medium with no loss of VQ

VP9 & HEVC decoders together support 99% of your installed base

30% reduction in bitrate can save Millions of ¥

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World-Class Proven Team

CEO Co-founder		Oliver Gunasekara	• Delivered 95% market share in mobile for ARM (1995 to 2007) • VP corporate BusDev / M&A and global director of mobile at ARM
VP Product Co-founder		Adam Malamy	• Architecture, design and verification of low latency H.264/AVC Codec • Director of engineering, W&W Comms and Cavium, FPGA & ASIC
CTO VP Algorithms		Pavel Novotny	• MPEG2, H.264, HEVC implemented in Software and ASIC • Video Algorithms at PixStream, VideoLocus, LSI Logic, Magnum
VP BusDev		Ian Jefferson	• Lead sales of the Magnum video encoding products for IDT • Senior/VP Sales and BusDev roles at IDT, Harmonic, etc.
VP Eng		Brian Angell	• Co-founded Nvidia mobile business unit and delivered Tegra products • VP Engineering at Nvidia for almost 12 years (2002 to 2013)

Team members previous company experience

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Live Cloud video transcoding

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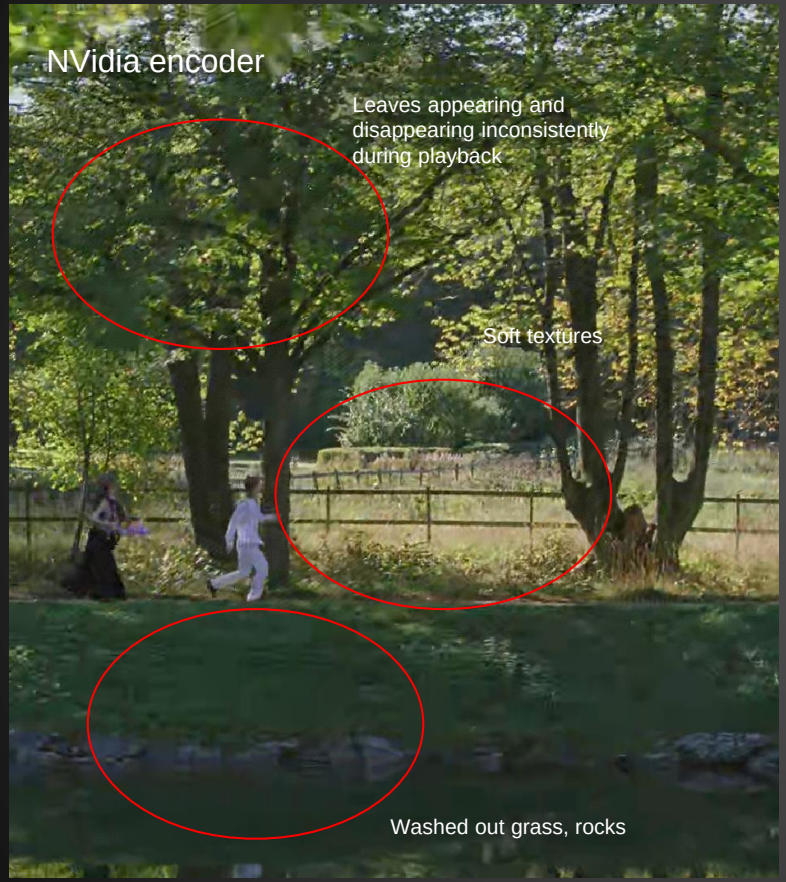
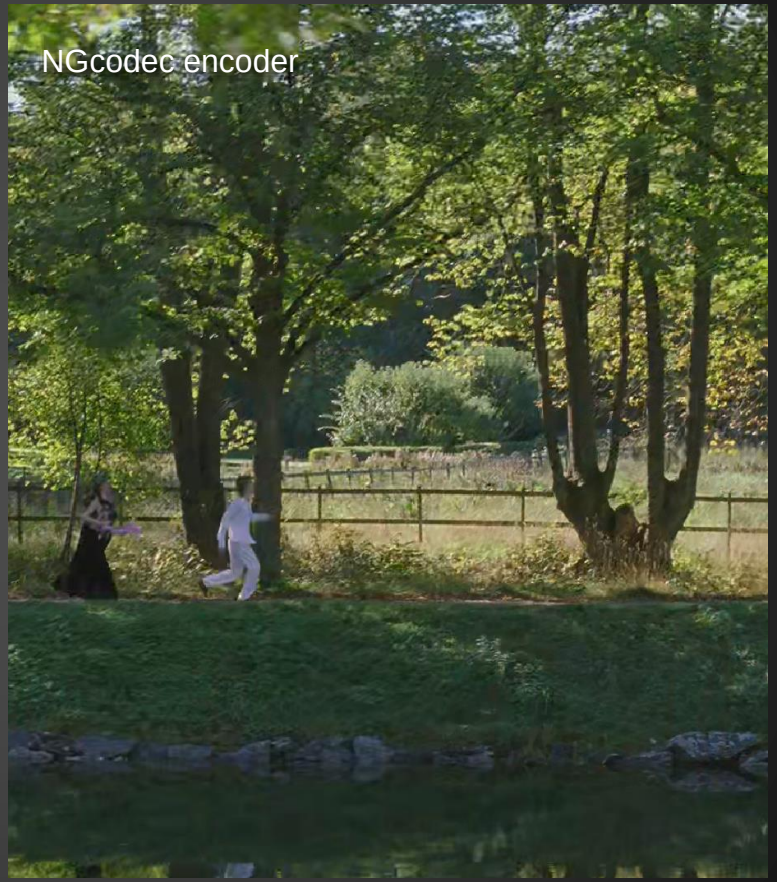
NVenc - Objective results





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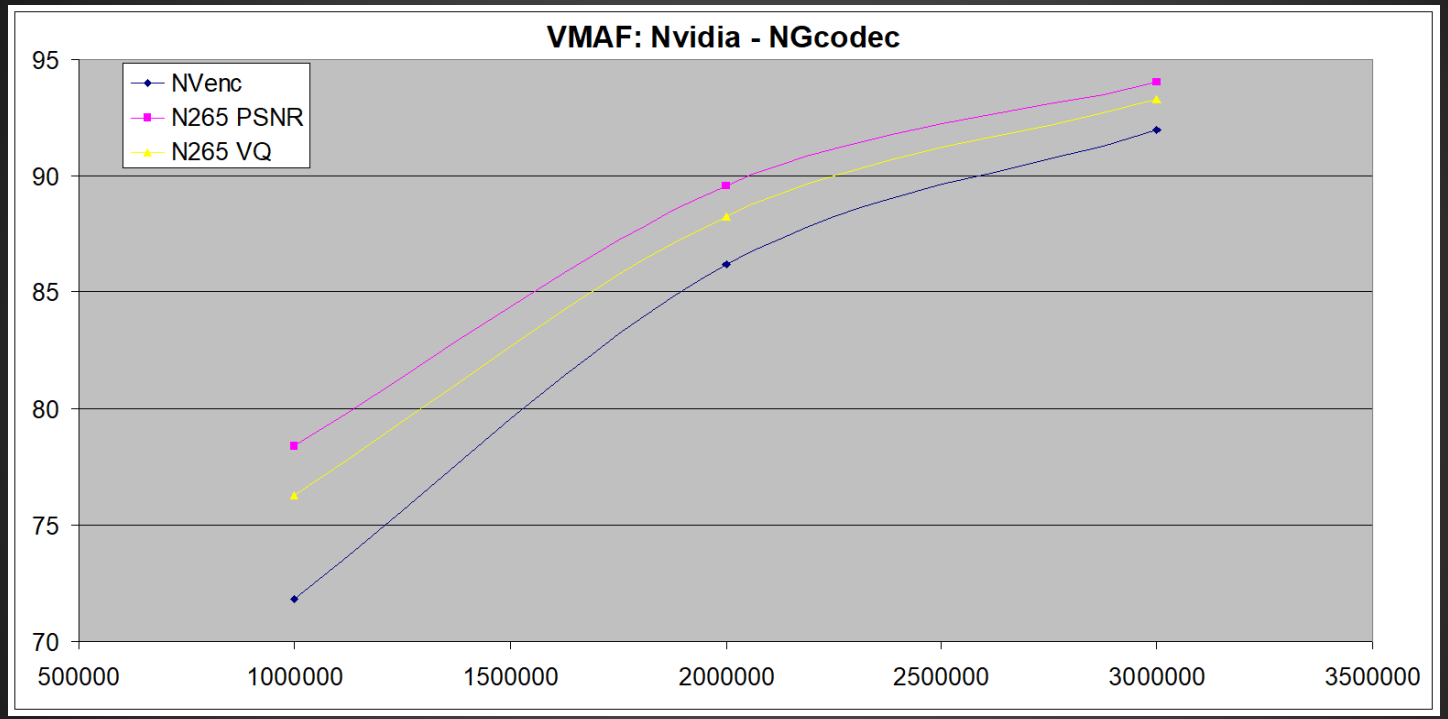
NVenc - NGcodec VMAF comparison



At VMAF score 80, NGcodec's HEVC encoder can deliver the same quality at 34% lower bitrate than NVenc

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Multi-pass encoding

- Multi-pass encoding is typically employed to improve Rate Control
- Improved Rate Control results in a more stable VQ during scenes, Faster (instantaneous) VQ change on scene changes
- Typically performed by running the encoder twice, it cuts the performance (density) to half
- Good Rate Control algorithm benefits little from multi-pass
- NGcodec’s encoders are not expected to benefit or need multi-pass encoding

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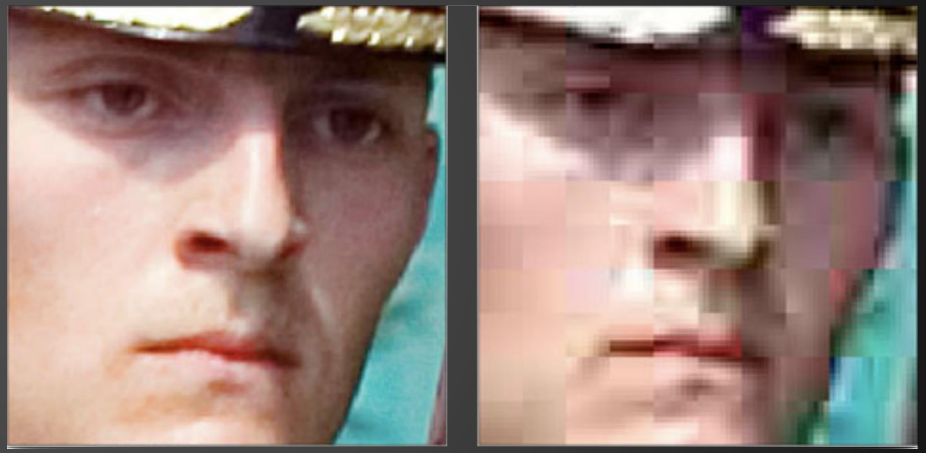
Why visual quality (VQ) matters?

Bandwidth and storage costs
(Service provider CDN & consumer data plan)



Quality of experience
(Startup time, visual quality, stalls)

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Streaming costs

Bandwidth to CDN costs
($0.06 per GByte, $M month)

Storage costs
($0.03 per GByte, $M month)

Computing encoding costs
($0.50 per Hour, $M Month)

Drivers:

Bitrate for specific VQ

Watts for specific video encoding

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How are CDN cost calculated?

Based on peak bandwidth in a period (minus 5%)

Not based on average or actual use of bandwidth

Analogy: you rent the Ballpark. It has 40K seats. It’s up to you to fill the seats

So, peak time drives CDN costs!

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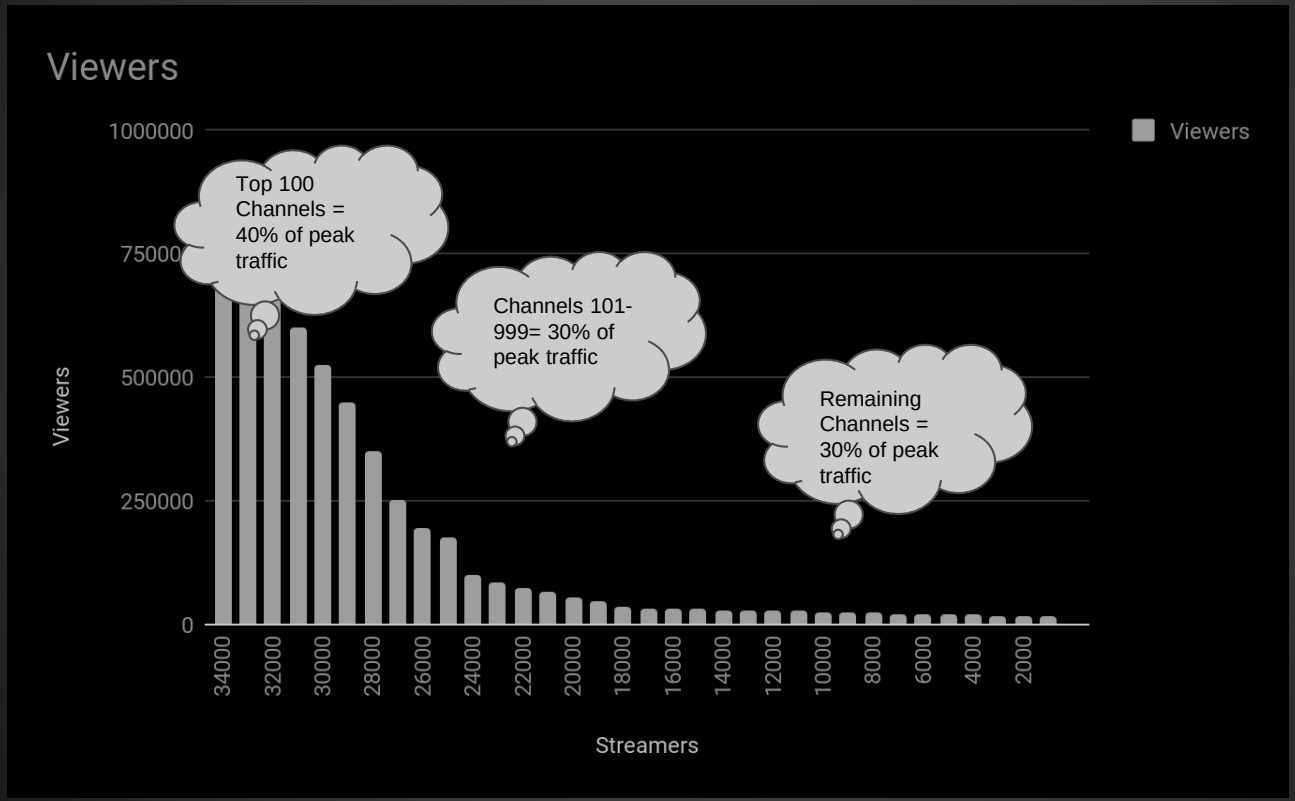
Live streaming distribution



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Examples

Example A

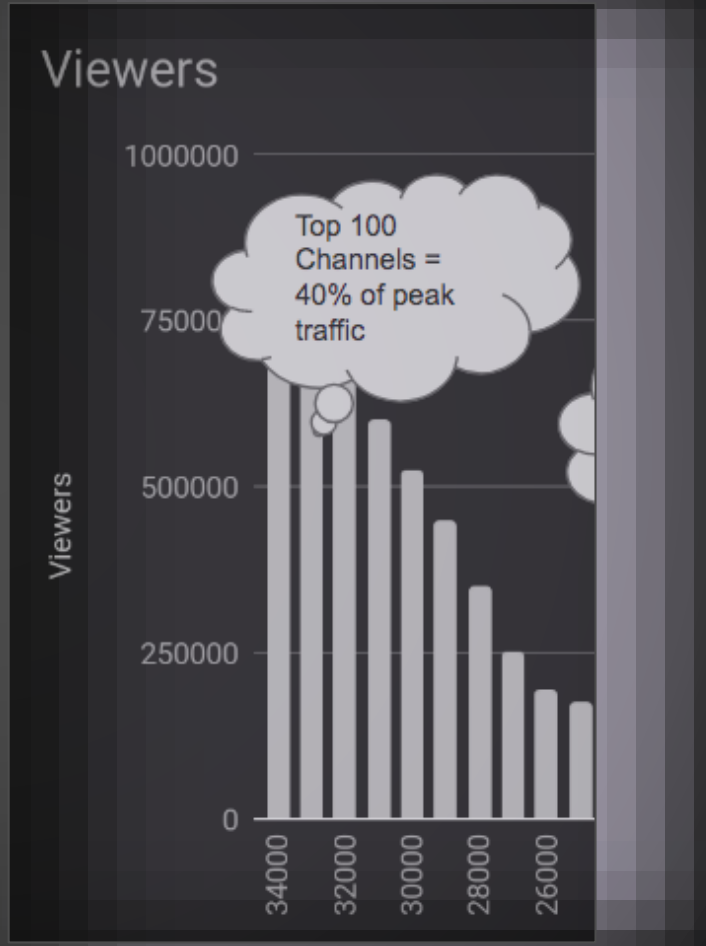
10K channels with average 1M viewers

1080p30 with H.264 at 3Mbps

Example B

10K channels with average 1M viewers

1080p30 with VP9/HEVC at 2.25Mbps



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Same VQ at 30% lower Bitrate

X264 Medium 1080p30 at 4Mbps = NGCodec VP9/HEVC 1080p30 at 2.8Mbps

CDN Costs

Example A

Peak Bandwidth = Number of Channels * Number of Viewers * bit rate per second

Peak Bandwidth = 10,000 * 1,000,000 * 4,000

Peak Bandwidth = 40,000,000,000,000 bits per second

Peak Bandwidth = 40,000 Gigabits or 40 Terabits a second

Peak Bandwidth = 5,000 Gigabytes or 5 Terabytes per second

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Financial impact of better compression

Cost per Bit for CDN Outbound Data Transfers

$0.03 per Gbit or $0.00000003 per bit

Viewers: Number of simultaneous users watching a channel

e.g 1,000,000

Streamers (Channels) per month: Number of different content streams

e.g. 50,000

Average Bitrate: How many average bits per second for the video

e.g. 3Mbps (or 3,000 bps) vs 2.25Mbps (2,250 bps); 33% reduction in bit rate

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Financial impact of better compression

CDN costs = Viewers * Channels per month * Average Bitrate * Cost per Bit

Today's Cost per month

= 800,000 * 34,000 * 8,000 * $0.00000002

= $4,352,000 Bandwidth CDN costs

NGCodec per month (34% reduction in bitrate)

= 800,000 * 34,000 * 5,280 * $0.00000002

= $2,872,320 Bandwidth CDN costs

Savings per month = $4,352,000 - $2,872,320 = **$1.47M** Excludes Storage

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VP9 & HEVC decoders together support 99% of your installed base

30% reduction in bitrate can save Millions of Euros, Dollars…..You pick your currency.

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Economic value of better compression

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