

How MainConcept can save you time and money

Benchmarks

April 2025

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MainConcept HEVC Benchmarks

Test Methodology

Hardware

- Intel Core i7-12700K, 64GB, Win 11

Software

- MainConcept HEVC Encoder 15.3
- x265 Version v4.0+19

Configuration

- MC HEVC performance level 28

Cinematic – Complex	Meridian 4k HDR	opencontent.netflix.amazonaws.com	715 GB	<ul style="list-style-type: none">– 3840x2160 @ 18 Mbit/s– 2560x1440 @ 15 Mbit/s– 1920x1080 @ 8 Mbit/s– 1280x720 @ 3 Mbit/s– 640x360 @ 700 kbit/s– 512x288 @ 240 kbit/s
Cinematic – Medium	Forest Lake 4k HDR	media.xiph.org	40.3 GB	<ul style="list-style-type: none">– 3840x2160 @ 18 Mbit/s– 2560x1440 @ 15 Mbit/s– 1920x1080 @ 8 Mbit/s– 1280x720 @ 3 Mbit/s– 640x360 @ 700 kbit/s– 512x288 @ 240 kbit/s
Cinematic - Simple	Smithy 4k SDR	media.xiph.org	61.5 GB	<ul style="list-style-type: none">– 3840x2160 @ 18 Mbit/s– 2560x1440 @ 15 Mbit/s– 2560x1440 @ 8 Mbit/s– 1920x1080 @ 4.4 Mbit/s– 1280x720 @ 2.4 Mbit/s– 640x360 @ 450 kbit/s– 512x288 @ 240 kbit/s
UGC/Animated	Hearthstone SDR	media.xiph.org	27.8 GB	<ul style="list-style-type: none">– 1920x1080 @ 2 Mbit/s– 1920x1080 @ 800 kbit/s– 1280x720 @ 400 kbit/s– 1280x720 @ 240 kbit/s

```
> ffmpeg -i mer_4K.h265 -y -vf scale=1920x1080:flags=lanczos -c:v omx_enc_hevc -force_key_frames expr:gte(t,n_forced*4) -omx_core omxil_core.dll -omx_name OMX.MainConcept.enc_hevc.video -omx_param "force_omx_param=0:preset=main10:perf_level=28:[HEVC Settings]:input_filtering=3:max_intra_period=0:vscd_mode=1:[HEVC Layer 0000]:hrd_conformance=1:bit_rate=4800000:hss_rate=9600000:cpb_size=19200000" encoded.h265
```

```
> ffmpeg -y -i mer_4K.h265 -vf scale=1920x1080:flags=lanczos -c:v libx265 -b:v 4800000 -preset slow -force_key_frames expr:gte(t,n_forced*4) -sc_threshold 40 -x265-params profile=main10:hrd=1:vbv-maxrate=9600:vbv-buFSIZE=19200:open-gop=0 -pix_fmt yuv420p10le encoded.h265
```

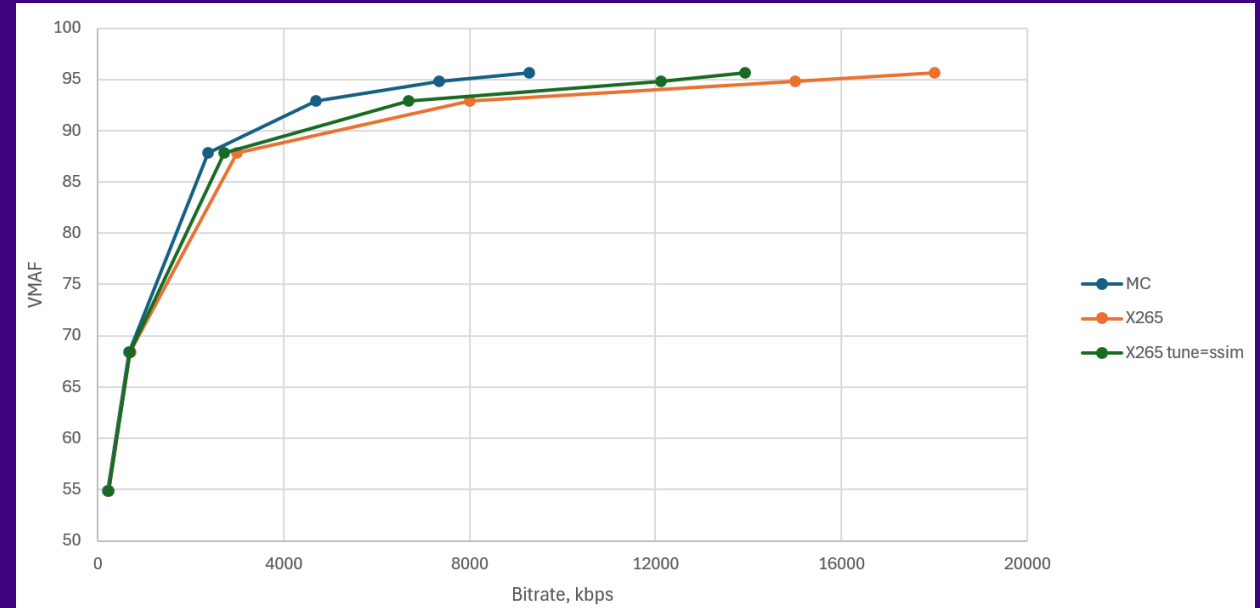
```
> ffmpeg -y -i mer_4K.h265 -vf scale=1920x1080:flags=lanczos -c:v libx265 -b:v 4800000 -preset slow -force_key_frames expr:gte(t,n_forced*4) -sc_threshold 40 -x265-params profile=main10:hrd=1:vbv-maxrate=9600:vbv-buFSIZE=19200:open-gop=0 -tune ssim -pix_fmt yuv420p10le encoded.h265
```

MainConcept HEVC Efficiency

How MainConcept outperforms x265



Meridian
Cinematic – Complex



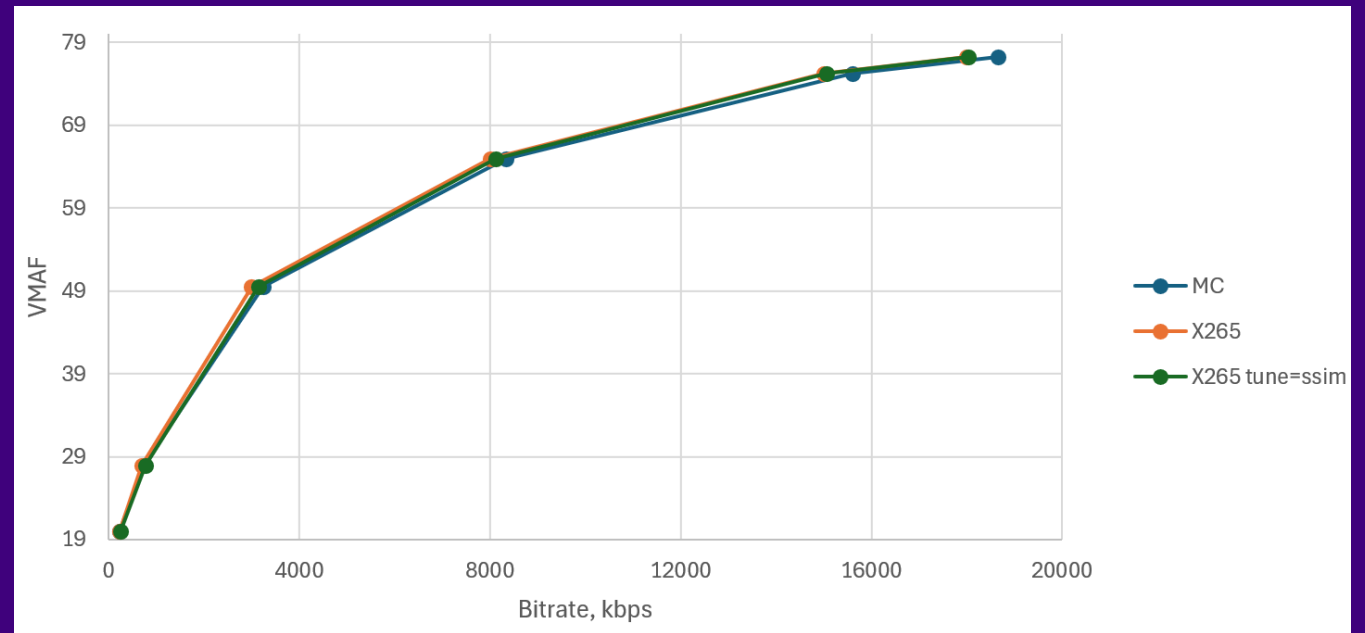
Resolution	MC Bitrate	X265* Bitrate	Saving
512x288	207.18	237.42	13%
640x360	679.09	691.89	2%
1280x720	2378.67	2723.25	13%
1920x1080	4701.20	6690.28	30%
2560x1440	7347.15	12124.19	39%
3840x2160	9290.69	13932.93	33%

MainConcept HEVC Efficiency

How MainConcept outperforms x265



Forest Lake
Cinematic – Medium



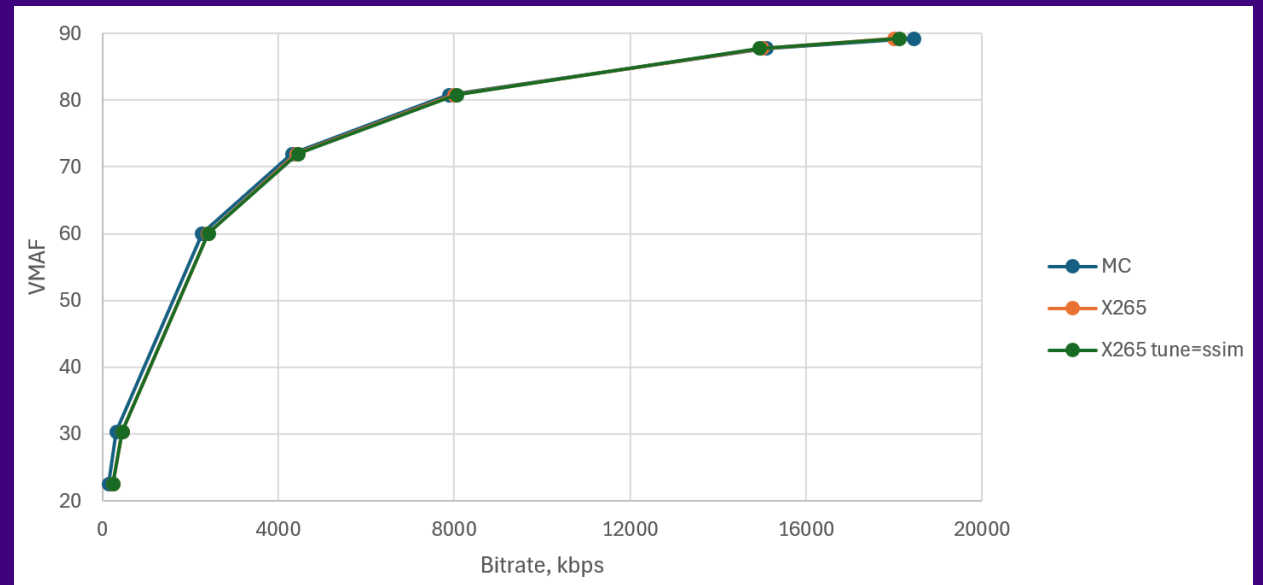
Resolution	MC Bitrate	X265* Bitrate	Saving
512x288	229.80	249.60	8%
640x360	735.78	769.77	4%
1280x720	3236.11	3147.39	-3%
1920x1080	8338.01	8117.66	-3%
2560x1440	15607.07	15054.13	-4%
3840x2160	18646.50	18029.58	-3%

MainConcept HEVC Efficiency

How MainConcept outperforms x265



Smithy
Cinematic – Simple



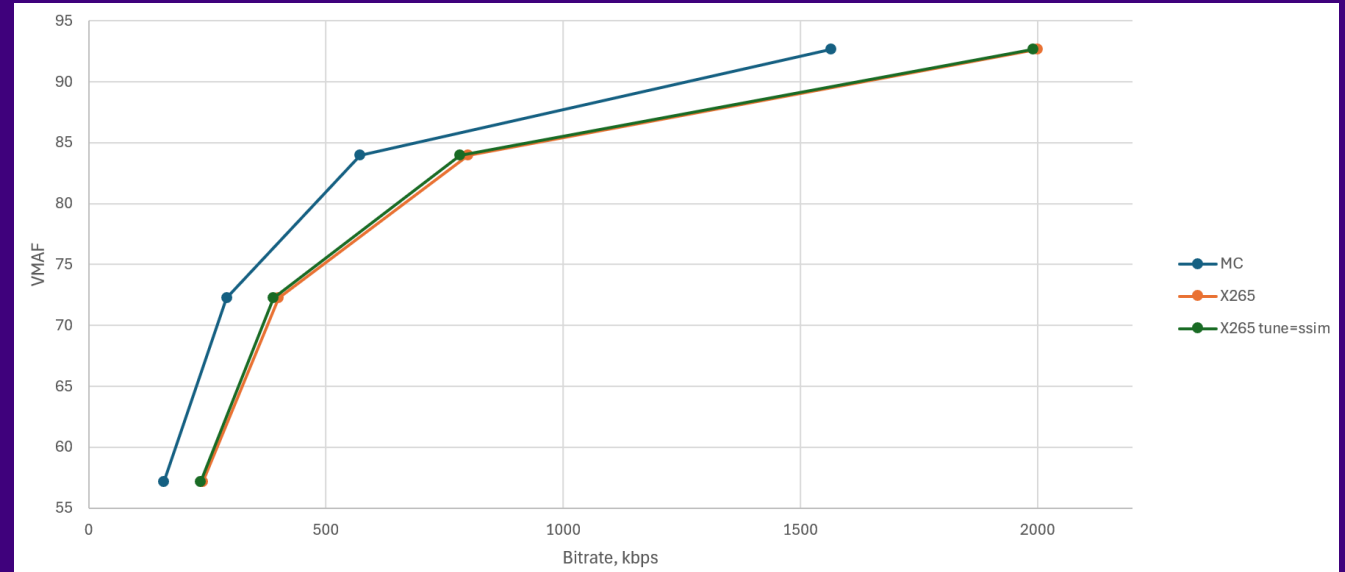
Resolution	MC Bitrate	X265* Bitrate	Saving
512x288	151.79	236.31	36%
640x360	318.24	453.08	30%
1280x720	2264.69	2407.14	6%
1920x1080	4303.32	4449.88	3%
2560x1440	7879.60	8049.53	2%
2560x1440	15089.15	14931.63	-1%
3840x2160	18437.16	18117.65	-2%

MainConcept HEVC Efficiency

How MainConcept outperforms x265



Hearthstone
UGC/Animated



Resolution	MC Bitrate	X265* Bitrate	Saving
1280x720	159.28	236.14	33%
1280x720	291.13	389.39	25%
1920x1080	572.51	783.09	27%
1920x1080	1565.77	1991.40	21%

MainConcept CDN Cost Savings

MainConcept HEVC Video Encoder vs x264 and CDN Data Transfer Costs

Claim

Using MainConcept HEVC Video Encoder instead of x265 can save you up to 20% from the CDN costs on data transfer.

Statement

- Using x265 in AWS with monthly data transfer of **100 TB**, you can reduce your CDN costs to about **\$15,000** annually.
- Using x265 in AWS with monthly data transfer of **1000 TB**, you can reduce your CDN costs to about **\$75,000** annually.
- Using x265 in AWS with monthly data transfer of **5000 TB**, you can reduce your CDN costs to about **\$300,000** annually.

Additional Information

- AWS and Azure use Tier pricing model, where the total amount of data transfer is distributed among the different tiers and individual Tier price is used for each tier portion. The total CDN cost is then calculated by summing the costs from all the tiers.
- Google Cloud has a standard pricing model, where the price of the entire amount of data transfer is calculated with a single price, depending on the usage.
- With all three models of AWS, Azure and Google, the saving end up being about the same – 20% from the original cost.

Backup

Monthly Data Transfer, Terabytes	102.32	1023.18	5115.91
Monthly CDN Cost, USD	\$7,274.59	\$40,612.30	\$145,390.28
Annual CDN Cost, USD	\$87,295.05	\$487,347.56	\$1,744,683.32
Monthly CDN Cost with MainConcept, USD	\$6,017.30	\$34,325.87	\$119,196.83
Annual CDN Cost with MainConcept, USD	\$72,207.62	\$411,910.43	\$1,430,361.96
Annual CDN Cost Savings with MainConcept, USD	\$15,087.43	\$75,437.13	\$314,321.37

Table was built based on the AWS CloudFront CDN calculator for CDN costs on the data transfer from AWS instance to the Internet.

MainConcept R&D Cost Savings

MainConcept R&D vs own R&D

Claim

Save \$3 to \$5 million by outsourcing your codec development.

Statement

- It costs over \$1 million per year to develop a next-generation codec during the early years. A company can save millions of dollars letting codec specialists do the development instead.
- Once the standard is finalized, it takes from 3 to 5 years to release a commercially viable codec. This is assuming there is a dedicated development team, otherwise it can take longer.

Backup

- The region where the bulk of a company's development takes place affects the integration and maintenance costs. These costs are based on teams primarily located in North America and Western Europe.
- Even if operating from a lower cost region, there is meaningful budget to be saved with EVA.
- Numbers were calculated based on our internal development costs along with intelligence gathered from customers/partners.

MainConcept EVA Cost Savings

MainConcept EVA Integration and Maintenance vs NVIDIA, Intel, AMD Direct Integration

Claim

Save 75% on integration costs

Statement

- It costs about \$150,000 to integrate one API, and \$50,000 per year to maintain it.
- The more APIs maintained, the higher the initial and recurring costs will be:

Number of APIs to Integrate	Integration	Annual Maintenance
1 API or EVA	\$150,000	\$50,000
2 APIs	\$300,000	\$100,000
3 APIs	\$450,000	\$150,000
4 APIs	\$600,000	\$200,000

Backup

- 75% savings is based on going from 4 APIs to 1.
- Many companies manage 2, 4 or more codecs via different APIs. MainConcept's API lets customers fall back to just one, greatly shrinking the cost to integrate and maintain their workflow.
- The region where the bulk of a company's development takes place affects the integration and maintenance costs. These costs are based on teams primarily located in North America and Western Europe.
- Even if operating from a lower cost region, there is meaningful budget to be saved with EVA.
- Numbers were calculated based on our internal development costs along with intelligence gathered from customers/partners.

Questions?

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