LigH	.hevc GCC10 [single .exe 8-10-12bit] w/ x86 w/ libx265.dll
Rigaya	.hevc GCC 9.3 [8-10-12bit] w/ x86
Patman	.hevc GCC 11+MSVC1925 [8-10-12bit]
ShortKatz	arm64~64e with x86 ? [?] macOS compiling needed
DJATOM-aMod	Intel, AMD zen1~2 [10bit], zen3 [10-12bit] GCC 10.2.1+GCC10.3
MeteorRain-yuuki	lsmash.mkv/mp4 或.hevc [lavf isn't as reliable as pipe acc. rumor] GCC 9.3+ICC 1900+MSVC 1916 [8][10][12bit]+[8-10-12bit]

ffmpeg all OS compatible. backup link: ottverse.com/ffmpeg-builds
mpv player a small sized opensource video player with no color issues afaik
x265GuiEx (Rigaya) 日本語, compiles by auto-setup, link for tutorial
Voukoder; V-Connector free Premiere/Vegas/AE/Davinci Studio with libx264, libx265 presets from this tutorial loaded, currently the best exp. solution
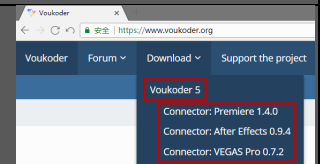
x265.exe command line for new users

[Download ffmpeg & x265 to a memorable path, in screenshot they are at D:\]

Creek-SC1NA400G (E:)			
София (D:)			
Regme-HDWD120-58I			
Cabliccus (I:)	ffmpeg.exe	2021/10/30 12:22	应用程序 93,660 KB
Hersert-HUH728080 (J			
Cynic-HUH724040 (N:)	x265-8bit.exe	2021/2/12 18:13	应用程序 20,720 KB
	x265-10bit.exe	2021/3/17 17:13	应用程序 1,174 KB

[Open Windows CMD/PowerShell or Linux/MacOS Bash/Terminal, write path & ffmpeg.exe, ffprobe.exe, x265.exe and enter; makesure all program exists]
[ffmpeg build ver.] ffmpeg.exe; [x265 build ver.] x265.exe -V

```
选择管理员: 命令提示符

Microsoft Windows [版本 10.0.17763.2628]
(c) 2018 Microsoft Corporation。保留所有权利。

C:\Users\JC>D:\x265-10bit.exe -V
x265 [info]: HEVC encoder version 3.5+20-4c4aee0bc [DJATOM's Mod]
x265 [info]: build info [Windows][GCC 10.2.1][64 bit] 10bit
x265 [info]: using cpu capabilities: MMX2 SSE2Fast LZCNT SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2

C:\Users\JC>D:\ffmpeg.exe
ffmpeg version n4.4.1-20211030 Copyright (c) 2000-2021 the FFmpeg developers
  built with gcc 10-win32 (GCC) 20210610
  configuration: --prefix=/ffbuild/prefix --pkg-config-flags=--static --pkg-config=pkg-config --cross-prefix=x86_64-w64-
mingw32- --arch=x86_64 --target-os=mingw32 --enable-gpl --enable-version3 --disable-debug --disable-w32threads --enable-
pthreads --enable-iconv --enable-libxml2 --enable-zlib --enable-libfreetype --enable-libfribidi --enable-gmp --enable-lz
ma --enable-fontconfig --enable-libvorbis --enable-opencl --enable-libvmaf --disable-vulkan --disable-xl
ib --enable-amf --enable-libaom --enable-avisynth --enable-libdav1d --enable-libdavs2 --disable-libfdk-aac --enable-ffnv
codec --enable-cuda-llvm --disable-frei0r --enable-libglslang --enable-libgme --enable-libass --enable-libbluray --enabl
e-libmp3lame --enable-libopus --enable-libtheora --enable-libvpx --enable-libwebp --enable-lv2 --enable-libmfx --enable-
libopencore-amrnb --enable-libopencore-amrwb --enable-libopenjpeg --enable-librav1e --enable-librubberband --enable-scha
nnel --enable-sdl2 --enable-libsoxr --enable-libsrt --enable-libsvtav1 --enable-libtwolame --enable-libuavs3d --disable-
libdrm --disable-vaapi --enable-libvidstab --enable-libx264 --enable-libx265 --enable-libxavs2 --enable-libxvid --enable
-libzimg --enable-libzvbi --extra-cflags=-DLIBTWOLAME_STATIC --extra-cxxflags= --extra-ldflags=-pthread --extra-ldexefla
gs= --extra-libs=-lgomp --extra-version=20211030
```

[Gain source video info w/ ffprobe] ffprobe.exe -i ".\video.mp4" -select_streams v:0 -v error -hide_banner -show_streams -show_frames -read_intervals "%+#1" -show_entries frame=top_field_first:stream=codec_long_name,width,coded_width,height,coded_height,pix_fmt,color_range,field_order,r_frame_rate,avg_frame_rate,nb_frames -of ini

```
[frames.frame.0]
top_field_first=0              Check when source video is interlaced

[streams.stream.0]
codec_long_name=H.264          Source codec
width=1920
height=1080
coded_width=1920               if != width:  horizontal rect. pixel
coded_height=1088              if != height: vertical rect. pixel
pix_fmt=yuv420p                Colorspace
color_range=tv                 Range (pc=full=0~255, tv-limited=16~235)
field_order=progressive        Field (progressive/interlaced/unknown)
r_frame_rate=24000/1001
avg_frame_rate=24000/1001 if != r_frame_rate: variable frame rate
nb_frames=20238                Total frame count
```

[interlaced] not a progressive video, check top/bottom field goes first & add x265 parameter --interlaced<tff/bff>

[variable frame rate] source used on mobile devices to save battery, causing compatibility issues. Add ffmpeg option -vsync cfr to convert to cfr

[rectangular pixel] old & unsupported lossy compression. Swap src video if possible

[encoding duration] nb_frames ÷ encoding speed (fps)=time(second)

[x265's required info] ffmpeg -pix_fmt<given by src video, similar as picture above>

[ffmpeg-pipe-x265 example]　　　　　　 D:\ffmpeg.exe -i F:\video.mov -an -pix_fmt yuv420p10 -f yuv4mpegpipe -strict unofficial - | D:\x265-10bit.exe --preset slow --hist-scenecut --me umh --subme 5 --merange 48 --weightb --aq-mode 4 --bframes 5 --ref 3 --hash 2 --allow-non-conformance --qg-size 16 --rd 3 --limit-modes --limit-refs 1 --rskip 1 --splitrd-skip --no-sao --tskip --colorprim bt2020 --colormatrix bt2020nc --transfer smpte2084 --y4m - --output F:\done.hevc 2>D:\Desktop\ffmpeg_or_x265_error_logs.txt

ffmpeg, VS, avs2yuv pipe

ffmpeg -i video_in.mp4 -an -f yuv4mpegpipe -strict unofficial - | x265 --y4m - --output

ffmpeg -i video_in.mp4 -an -f rawvideo - | x265.exe --input-res <WxH> --fps <int/flo/frac> - --output

-format, -an bypass audio, -strict unofficial lift std. restrictions, --y4m stands for "YUV for MPEG", both "-" passes stream through the Unix pipe

VSpipe.exe　　　 VSScript.vpy --y4m - | x265.exe - --y4m --output

```
VSpipe/avs2yuv   VSScript.vpy - | x265.exe --input-res <WxH> --fps <int/flo/frac> - --output

avs2yuv.exe      AVSScript.avs -raw   - | x265.exe --input-res <WxH> --fps <int/flo/frac> - --output
```

ffmpeg .ass subtitle rendering: −filter_complex "ass='F\:/subtitle.ass'"

Stop encoding & mux encoded frames: Ctrl+C, exists in some people's x265 compile

ffmpeg multiplex audio into video encap. (output file extension alters format)

- ffmpeg.exe −i ".\video_stream.mp4" −an −c:v copy −i ".\audio_stream.aac" −c copy "multiplexed.mov"

ffmpeg replace existing audio in video encap. (itoffset ±seconds to align new audio)

- ffmpeg.exe −i ".\mux_in.mov" −i ".\new_ad_st_in.aac" −c:v copy −map 0:v:0 −map 1:a:0 −c:a copy −itsoffset 0   ".\new_mux_out.mov"

ffmpeg built-in scaling: −sws_flags bicubic bitexact gauss neighbor bicublin lanczos spline +full_chroma_int

+full_chroma_inp +accurate_rnd

Example: −sws_flags bitexact+full_chroma_int+full_chroma_inp+accurate_rnd)

HDR Tags   −−master−display <manually tagging for instruct video players or decoders to correctly play HDR sources

        DCI−P3:   G(13250,34500)B(7500,3000)R(34000,16000)WP(15635,16450)L(?,1)

        bt709:   G(15000,30000)B(7500,3000)R(32000,16500)WP(15635,16450)L(?,1)

        bt2020:   G(8500,39850)B(6550,2300)R(35400,14600)WP(15635,16450)L(?,1)

- Check HDR source's metadata for color space，then copy the corresponding settings above as param value
- max for L has no standards，which means every video could be different, check your source stream

        DCI−P3:   G(x0.265, y0.690), B(x0.150, y0.060), R(x0.680, y0.320), WP(x0.3127, y0.329)

        bt709:   G(x0.30, y0.60), B(x0.150, y0.060), R(x0.640, y0.330), WP(x0.3127,y0.329)

        bt2020:   G(x0.170, y0.797), B(x0.131, y0.046), R(x0.708, y0.292), WP(x0.3127,y0.329)>

        −− cll <same value as master−display max L>

Color   −−colormatrix <as src, e.g.: gbr bt709 fcc bt470bg smpte170m YCgCo bt2020nc bt2020c smpte2085 ictcp>

Primaries −−transfer <as source, e.g.: gbr bt709 fcc bt470bg smpte170m YCgCo bt2020nc bt2020c smpte2085 ictcp>

Encoding speed reference

Processor: R7 5800X all core 4.5Ghz w/ negative voltage auto-offset, 67°C under FC140, avg 15440pts under CbR23 (PBO2 4.85Ghz minus 30 curve offset, 86°C under FC140, only raises 2%, thus unused)

RAM: Hynix MFR 2×2R×8GB/2x16GB, 3000Mhz 15-17-17-35 1T 1.44V, F-U-MCLK 1:1:1 sync

Source: 1920x1080 yuv420p8 24000/1001fps 312MB low quality h.264 film source, high contrast texture complex foreground, static low contrast background, 20238 frames

Method: 10bit crf 28 to enhance depth error, low quality source reduces result difference, high contrast complex texture forces encoder to reduce skipping functions

preset slow: 16m 27s, avg~20.5fps, results in 217MB, visible quality loss (more visible in HQ source)

Gen•Simple: 24m 48s, avg~13.6fps, 1.5x slower than top, in 159MB, visible quality loss

Anime•HC: 36m 36s, avg~9.21fps, 2.2x slower than top, in 145MB, visible quality loss (film src)

Film•HC: 78m 57s, avg~4.27fps, 4.8x slower than top, in 189MB, very small loss

veryslow: 133m 16s, avg~2.53fps, 8.1x slower than top, in 221MB, very small loss

Gen-Purpose·Simple·LQ

no more configurable options for simplicity, only a few fps slower than top

splt-trans   −−preset slow −−hist−scenecut

me-mc   −−me umh −−subme 5 −−merange 48 −−weightb

adpt quant   −−aq−mode 4

rate control   −−bframes 5 −−ref 3

io   −−hash 2 −−allow−non−conformance

tgt. depth   −D 8/10/12 (default 8bit or lowest built in x265.exe, same or convert to lower depth only w/ −−dither)

multi node   −−pools ,,,, (e.g.: "−,+"states PC w/ 2 nodes & use the 2nd only, using both nodes causes mem. delay)

others   crop: −−display−window < integer "←, ↑ ,→, ↓ " pixels >, ≥16 core cpu opt.: −−pme,

interlaced: −−field, pixel depth reduction quality+: −−dither, begin; ending frame: −−seek; −−

frames, crf/abr resist noise factor: −−rc−grain

colorspace   ffmpeg −pix_fmt yuv420p / yuv422p / yuv444p / yuv420p10 / yuv422p10 / yuv444p10...

(ffmpeg pipe) x265 CLI parameters

• ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −an −

f yuv4mpegpipe −pix_fmt<ffprobe pix_fmt> −strict unofficial − | x265.exe −−preset slow −−hist−

scenecut −−me umh −−subme 5 −−merange 48 −−weightb −−aq−mode 4 −−bframes 5 −−ref 3 −−hash

2 −−allow−non−conformance −−y4m − −−output ".\v_out.mp4"

libx265 CLI, compatible w/ libav fork

• ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −c:v

libx265 −pix_fmt<ffprobe pix_fmt> −x265params "preset=slow:hist−

scenecut=1:me=umh:subme=5:merange=48:weightb=1:bframes=5:ref=3:hash=2:allow−non−

conformance=1" −c:a copy ".\v_out.mp4"

libkvazaar CLI (in dev, crf mode missing) (libx265 ffmpeg CLI is lacking 85% of params, skipped)

- ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −c:v

  libkvazaar −pix_fmt<ffprobe pix_fmt> −kvazaar−params "limit−tu=1:tr−depth−intra=2:pu−depth−

  intra=4:pu−depth−inter=3:smp=1:amp=1:bipred=1:me=tz:subme=4:merange=48:me−early−

  termination=off:max−merge=2:ref=3:open−gop=0:period=360:gop=16:transform−skip=1:qp=16:fast−

  residual−cost=1:early−skip=1:max−merge=4:rd=3:mv−rdo=1:rdoq−skip=1:intra−rdo−

  et=1:sao=edge:hash=checksum" −c:a copy ".\v_out.mp4"

Customize·Standard.

splt-trans   −−tu−intra−depth 3 −−tu−inter−depth 3 −−limit−tu 1 −−rdpenalty 1

me-mc   −−me umh −−subme <24fps=3, 48fps=4, 60fps=5, 100fps=6> −−merange 48 −−weightb

ref-rateol   −−ref 3 −−max−merge <2fast, 3, 4slow> −−early−skip −−no−open−gop −−min−keyint 5 −−

keyint <9×fps> −−fades −−bframes 8 −−b−adapt 2 −−radl 3 <sharp source: −−pbratio 1.2>

intra coding   −−hist−scenecut <fast: −−fast−intra / mid: leave blank / slow: −−b−intra / slower: −−constrained−intra >

quantization   −−crf <18~20 low loss 19 ~22 good> −−crqpoffs −3 −−cbqpoffs −1

rdoq   −−rdoq−level <1fast，2slow>

adapt quant   <anime source: −−hevc−aq, remove aq−mode> −−aq−mode 4 −−aq−strength <flat=0.8, edgy=1>

md decision   −−rd 3 −−limit−modes −−limit−refs 1 −−rskip <3fast, 2mid, 1slow> −−rc−lookahead <3×fps> −

−tskip−fast −−rect <veryslow: −−amp>

rdo   −−psy−rd <film=1.6，anime=0.6, +0.6 if ctu=64, −0.6 if ctu=16> −−splitrd−skip <EXP: −−qp−

adaptation−range 3>

deblock-sao   −−limit−sao −−sao−non−deblock −−deblock 0:−1

io   −−hash 2 −−allow−non−conformance <NAS streaming: −−idr−recovery−sei>

tgt. depth   −D 8/10/12 (default 8bit or lowest built in x265.exe, same or convert to lower depth only w/ −−dither)

multi node   −−pools ,,,, (e.g.: "−,+"states PC with 2 nodes & use the 2nd only, using both nodes causes mem. delay)

others   crop: −−display−window < integer "←, ↑ ,→, ↓ " pixels >, ≥16 core cpu opt.: −−pme,

interlaced: −−field, pixel depth reduction quality+: −−dither, begin; ending frame: −−seek; −−

frames, crf/abr resist noise factor: −−rc−grain

colorspace   ffmpeg −pix_fmt yuv420p / yuv422p / yuv444p / yuv420p10 / yuv422p10 / yuv444p10···

(ffmpeg pipe) x265 CLI parameters

- ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −an −f yuv4mpegpipe −strict unofficial −pix_fmt<ffprobe pix_fmt> − | x265.exe −−ctu ◯ −−min−cu−size 16 −−tu−intra−depth 3 −−tu−inter−depth 3 −−limit−tu 1 −−rdpenalty 1 −−me umh −−subme ◯ −−merange 48 −−weightb −−ref 3 −−max−merge ◯ −−early−skip −−no−open−gop −−min−keyint 5 −−fades −−bframes 8 −−b−adapt 2 −−radl 3 −−pbratio 1.2 −−hist−scenecut −−fast−intra −−b−intra −−constrained−intra −−crf ◯ −−crqpoffs −3 −−crqpoffs −1 −−rdoq−level ◯ −−aq−mode 4 −−aq−strength ◯ −−rd 3 −−limit−modes −−limit−refs 1 −−rskip ◯ −−rc−lookahead ◯ −−tskip−fast −−rect −−amp −−psy−rd ◯ −−splitrd−skip −−qp−adaptation−range 4 −−limit−sao −−sao−non−deblock −−deblock 0:−1 −−hash 2 −−allow−non−conformance −−y4m − −−output ".\v_out.mp4"

libx265 CLI, compatible w/ libav fork

- ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −c:v libx265 −pix_fmt<ffprobe pix_fmt> −x265params "ctu=◯:min−cu−size=16:tu−intra−depth=3:tu−inter−depth=3:limit−tu=1:rdpenalty=1:me=umh:subme=◯:merange=48:weightb=1:ref=3:max−merge=◯:early−skip=1:open−gop=0:min−keyint=5:fades=1:bframes=8:b−adapt=2:radl=3:pbratio=1.2:hist−scenecut=1:fast−intra=1:b−intra=1:constrained−intra=1:crf=◯:crqpoffs=−3:cbqpoffs=−1:rdoq−level=◯:aq−mode=4:aq−strength=◯:rd=3:limit−modes=1:limit−refs=1:rskip=◯:rc−lookahead=◯:tskip−fast=1:rect=1:amp=1:psy−rd=◯:splitrd−skip=1:qp−adaptation−range=4:limit−sao=1:sao−non−deblock=1:deblock=1:deblock=0:−1:hash=2:allow−non−conformance=1" −c:a copy ".\v_out.mp4"

High Compression·Film·HQ Source

splt-trans   --tu-intra-depth 4 --tu-inter-depth 4 --limit-tu 1

me-mc   --me star --subme <24fps=3, 48fps=4, 60fps=5, 100fps=6> --merange 48 --weightb

ref-rateol   --ref 3 --max-merge 4 --no-open-gop --min-keyint 3 --keyint 310 --fades --bframes

8 --b-adapt 2 --radl 3

intra coding --hist-scenecut --constrained-intra --b-intra

quantization --crf 21.8 --qpmin 8 --crqpoffs -3 --ipratio 1.2 --pbratio 1.5

rdoq   --rdoq-level 2

adapt.quant --aq-mode 4 --aq-strength <clean source=0.8，film=1> --qg-size 8

md decision --rd 3 --limit-refs 0 --rskip 0 --rc-lookahead <1.8×fps> --rect --amp

rdo   --psy-rd <film=1.6, animation=0.6, +0.6 if ctu=64, -0.6 if ctu=16> <EXP: --qp-adaptation-range 3>

deblock   --deblock 0:0

sao   --limit-sao --sao-non-deblock --selective-sao 3

io   --hash 2 --allow-non-conformance --nr-inter 8 <NAS streaming: --idr-recovery-sei>

tgt. depth -D 8/10/12 (default 8bit or lowest built in x265.exe, same or convert to lower depth only w/ --dither)

multi node --pools ,,,, (e.g.: "-,+"states PC with 2 nodes & use the 2nd only, using both nodes causes mem. delay)

others   crop: --display-window < integer "←,↑,→,↓ " pixels >, ≥16 core cpu opt.: --pme, interlaced: --

field, pixel depth reduction quality+: --dither, begin; ending frame: --seek; --frames, crf/abr resist

noise factor: --rc-grain

colorspace ffmpeg -pix_fmt yuv420p / yuv422p / yuv444p / yuv420p10 / yuv422p10 / yuv444p10···

(ffmpeg pipe) x265 CLI parameters

- ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −an −f yuv4mpegpipe −strict unofficial −pix_fmt<ffprobe pix_fmt> − | x265.exe −−tu−intra−depth 4 −−tu−inter−depth 4 −−limit−tu 1 −−me star −−subme ◯ −−merange 48 −−weightb −−ref 3 −−max−merge 4 −−no−open−gop −−min−keyint 3 −−keyint 310 −−fades −−bframes 8 −−b−adapt 2 −−radl 3 −−hist−scenecut −−constrained−intra −−b−intra −−crf 21.8 −−qpmin 8 −−crqpoffs −3 −−ipratio 1.2 −−pbratio 1.5 −−rdoq−level 2 −−aq−mode 4 −−aq−strength ◯ −−qg−size 8 −−rd 3 −−limit−refs 0 −−rskip 0 −−rc−lookahead ◯ −−rect −−amp −−psy−rd ◯ −−qp−adaptation−range 3 −−deblock 0:0 −−limit−sao −−sao−non−deblock −−selective−sao 3 −−hash 2 −−allow−non−conformance −−y4m − −−output ".\v_out.mp4"

libx265 CLI, compatible w/ libav fork

- ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −c:v libx265 −pix_fmt<ffprobe pix_fmt> −x265params "tu−intra−depth=4:tu−inter−depth=4:limit−tu=1:me=star:subme= ◯ :merange=48:weightb=1:ref=3:max−merge=4:open−gop=0:min−keyint=3:keyint=310:fades=1:bframes=8:b−adapt=2:radl=3:hist−scenecut=1:constrained−intra=1:b−intra=1:crf=21.8:qpmin=8:crqpoffs=−3:ipratio=1.2:pbratio=1.5:rdoq−level=2:aq−mode=4:aq−strength= ◯ :qg−size=8:rd=3:limit−refs=0:rskip=0:rc−lookahead= ◯ :rect=1:amp=1:psy−rd= ◯ :qp−adaptation−range=3:deblock=0:0:limit−sao=1:sao−non−deblock=1:selective−sao=3:hash=2:allow−non−conformance=1" −c:a copy ".\v_out.mp4"

Editing footage·Render & Reuse

block/unit spitting——ctu 32

motion est.&cmp ——me star ——subme <24fps=3, 48fps=4, 60fps=5, 100fps=6> ——merange 48 ——analyze—src—

.   pics

intraframe search ——max—merge 4 ——early—skip ——b—intra

rate control   ——hist—scenecut ——no—open—gop ——min—keyint 1 ——keyint <7×fps>——ref 3 ——fades —

                      —bframes 7 ——b—adapt 2

quantization   ——crf 17 ——crqpoffs —3 ——cbqpoffs —2

mode decision   ——rd 3 ——limit—modes ——limit—refs 1 ——rskip 1 ——rc—lookahead <4×fps>

R-D optimization   ——splitrd—skip

deblock   ——deblock —1:—1

input output   ——hash 2 ——allow—non—conformance

tuning   ——tune grain

tgt pixel bit depth —D 8/10/12

others   crop: ——display—window < integer "←,↑,→,↓ " pixels >, ≥16 core cpu opt.: ——pme,

                      interlaced: ——field, pixel depth reduction quality+: ——dither, begin; ending frame: ——seek;

                      ——frames, crf/abr resist noise factor: ——rc—grain, multi—node: ——pools ,,,,

colorspace   ffmpeg —pix_fmt yuv420p / yuv422p / yuv444p / yuv420p10 / yuv422p10 / yuv444p10···

(ffmpeg pipe) x265 CLI parameters

- ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −an −f yuv4mpegpipe −strict unofficial −pix_fmt<ffprobe pix_fmt> − | x265.exe −−ctu 32 −−me star −−subme ◯ −−merange 48 −−analyze−src−pics −−max−merge 4 −−early−skip −−b−intra −−hist−scenecut −−no−open−gop −−min−keyint 1 −−keyint ◯ −−ref 3 −−fades −−bframes 7 −−b−adapt 2 −−crf 17 −−crqpoffs −3 −−cbqpoffs −2 −−rd 3 −−limit−modes −−limit−refs 1 −−rskip 1 −−rc−lookahead ◯ −−splitrd−skip −−deblock −1:−1 −−hash 2 −−allow−non−conformance −−tune grain −−y4m − −−output ".\v_out.mp4"

libx265 CLI, compatible w/ libav fork

- ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −c:v libx265 −pix_fmt<ffprobe pix_fmt> −x265params "ctu=32:me=star:subme=◯:merange=48:analyze−src−pics=1:max−merge=4:early−skip=1:hist−scenecut=1:open−gop=0:min−keyint=1:keyint=◯:ref=3:fades=1:bframes=7:b−adapt=2:radl=3:constrained−intra=1:b−intra=1:crf=17:crqpoffs =−3:cbqpoffs=−2:rd=3:limit−modes=1:limit−refs=1:rskip=1:rc−lookahead=◯:splitrd−skip=1:deblock=−1:−1:hash=2:allow−non−conformance=1:tune=grain" −c:a copy ".\v_out.mp4"

Anime·High Compression·Subtitle Groups

splt-trans   −−tu−intra−depth 4 −−tu−inter−depth 4 −−max−tu−size 16

me-mc   −−me umh −−merange 48 −−subme <24fps=3, 48fps=4, 60fps=5, 100fps=6> −−weightb <remove weightb for 80's anime that doesn't have lighting fades for performance> −−max−merge 4 −−early−skip

ref-rateol   −−ref 3 −−no−open−gop −−min−keyint 5 −−keyint <12×fps> −−fades −−bframes 16 −−b−adapt 2 −−radl 3 −−bframe−bias 20

intra coding −−hist−scenecut −−constrained−intra −−b−intra

quantization −−crf 22 −−crqpoffs −4 −−cbqpoffs −2 −−ipratio 1.6 −−pbratio 1.3 −−cu−lossless −−tskip

rdoq   −−psy−rdoq 2.3 −−rdoq−level 2

aq   −−hevc−aq −−aq−strength 0.9 −−qg−size 8

md   −−rd 3 −−limit−modes −−limit−refs 1 −−rskip 1 −−rc−lookahead <2.5×fps> −−rect −−amp

rdo   −−psy−rd 1.5 −−splitrd−skip −−rdpenalty 2 <EXP: −−qp−adaptation−range 4>

deblock -sao −−deblock 0:−1 −−limit−sao −−sao−non−deblock

io   −−hash 2 −−allow−non−conformance −−single−sei <NAS streaming: −−idr−recovery−sei>

tgt. depth   −D 8/10/12 (default 8bit or lowest built in x265.exe, same or convert to lower depth only w/ −−dither)

multi nodes −−pools ,,,, (e.g.: "−,+"states PC with 2 nodes & use the 2nd only, using both nodes causes mem. delay)

others   crop: −−display−window < integer "←, ↑,→,↓ " pixels >, ≥16 core cpu opt.: −−pme, interlaced: −−field, pixel depth reduction quality+: −−dither, begin; ending frame: −−seek; −−frames, crf/abr resist noise factor: −−rc−grain

colorspace ffmpeg −pix_fmt yuv420p / yuv422p / yuv444p / yuv420p10 / yuv422p10 / yuv444p10...

(ffmpeg pipe) x265 CLI parameters

- ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −an −f yuv4mpegpipe −strict unofficial −pix_fmt<ffprobe pix_fmt> − | x265.exe −−tu−intra−depth 4 −−tu−inter−depth 4 −−max−tu−size 16 −−me umh −−subme ◯ −−merange 48 −−weightb −−max−merge 4 −−early−skip −−ref 3 −−no−open−gop −−min−keyint 5 −−keyint ◯ −−fades −−bframes 16 −−b−adapt 2 −−radl 3 −−bframe−bias 20 −−hist−scenecut −−constrained−intra −−b−intra −−crf 22 −−crqpoffs −4 −−cbqpoffs −2 −−ipratio 1.6 −−pbratio 1.3 −−cu−lossless −−tskip −−psy−rdoq 2.3 −−rdoq−level 2 −−hevc−aq −−aq−strength 0.9 −−qg−size 8 −−rd 3 −−limit−modes −−limit−refs 1 −−rskip 1 −−rc−lookahead ◯ −−rect −−amp −−psy−rd 1.5 −−splitrd−skip −−rdpenalty 2 −−qp−adaptation−range 4 −−deblock −1:0 −−limit−sao −−sao−non−deblock −−hash 2 −−allow−non−conformance −−single−sei −−y4m − −−output ".\v_out.mp4"

libx265 CLI, compatible w/ libav fork

- ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −c:v libx265 −pix_fmt<ffprobe pix_fmt> −x265params "tu−intra−depth=4:tu−inter−depth=4:max−tu−size=16:me=umh:subme=◯:merange=48:weightb=1:max−merge=4:early−skip=1:ref=3:open−gop=0:min−keyint=5:keyint=◯:fades=1:bframes=16:b−adapt=2:radl=3:bframe−bias=20:hist−scenecut=1:constrained−intra=1:b−intra=1:crf=22:crqpoffs=−4:cbqpoffs=−2:ipratio=1.6:pbratio=1.3:cu−lossless=1:tskip=1:psy−rdoq=2.3:rdoq−level=2:hevc−aq=1:aq−strength=0.9:qg−size=8:rd=3:limit−modes=1:limit−refs=1:rskip=1:rc−lookahead=◯:rect=1:amp=1:psy−rd=1.5:splitrd−skip=1:rdpenalty=2:qp−adaptation−range=4:deblock=−1:0:limit−sao=1:sao−non−deblock=1:hash=2:allow−non−conformance=1:single−sei=1" −c:a copy ".\v_out.mp4"

Anime·ripper's cold war·HEDT Only

Paused dark flat scenes must look AS-IS, results less & slower compression than sub grps

splt-trans   --tu-intra-depth 4 --tu-inter-depth 4 --max-tu-size 4 --limit-tu 1

me-mc   --me star --subme <24fps=3, 48fps=4, 60fps=5, 100fps=6> --merange 52 --analyze-src-pics --weightb --max-merge 4

ref-rateol   --ref 3 --no-open-gop --min-keyint 1 --keyint <12×fps> --fades --bframes 16 --b-adapt 2 --radl 2

intra coding   --hist-scenecut --b-intra

quantization   --crf 17 --crqpoffs -5 --cbqpoffs -2 --ipratio 1.67 --pbratio 1.33

lossless qnt   --cu-lossless

rdoq   --psy-rdoq 2.5 --rdoq-level 2

aq   --hevc-aq --aq-strength 1.4 --qg-size 8

md   --rd 5 --limit-refs 0 --rskip 0 --rc-lookahead <2.5 × fps> --rect --amp --no-cutree

rdo   --psy-rd 1.5 --rdpenalty 2 <EXP: --qp-adaptation-range 5>

deblock   --deblock -2:-2

sao   --limit-sao --sao-non-deblock --selective-sao 1

io   --hash 2 --allow-non-conformance --single-sei <NAS streaming: --idr-recovery-sei>

others   crop: --display-window < integer "←, ↑ ,→, ↓ " pixels >, ≥16 core cpu opt.: --pme, interlaced: --field, pixel depth reduction quality+: --dither, begin; ending frame: --seek; --frames, crf/abr resist noise factor: --rc-grain, target depth: -D 8/10/12, multi-node: --pools ,,,,

(ffmpeg pipe) x265 CLI parameters

- ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −an −f yuv4mpegpipe −strict unofficial −pix_fmt<ffprobe pix_fmt> − | x265.exe −−tu−intra−depth 4 −−tu−inter−depth 4 −−max−tu−size 4 −−limit−tu 1 −−me star −−subme ◯ −−merange 52 −−analyze−src−pics −−weightb −−max−merge 4 −−ref 3 −−no−open−gop −−min−keyint 1 −−keyint ◯ −−fades −−bframes 16 −−b−adapt 2 −−radl 2 −−hist−scenecut −−b−intra −−crf 16 −−crqpoffs −5 −−cbqpoffs −2 −−ipratio 1.67 −−pbratio 1.33 −−cu−lossless −−psy−rdoq 2.5 −−rdoq−level 2 −−hevc−aq −−aq−strength 1.4 −−qg−size 8 −−rd 5 −−limit−refs 0 −−rskip 0 −−rc−lookahead ◯ −−rect −−amp −−no−cutree −−psy−rd 1.5 −−rdpenalty 2 −−qp−adaptation−range 5 −−deblock −2:−2 −−limit−sao −−sao−non−deblock −−selective−sao 1 −−hash 2 −−allow−non−conformance −−single−sei −−y4m − −−output ".\v_out.mp4"

libx265 CLI, compatible w/ libav fork

- ffmpeg.exe −thread_queue_size 5000 −loglevel 16 −hwaccel auto −y −hide_banner −i ".\v_in.mp4" −c:v libx265 −pix_fmt<ffprobe pix_fmt> −x265params "tu−intra−depth=4:tu−inter−depth=4:max−tu−size=4:limit−tu=1:me=star:subme=◯:merange=52:analyze−src−pics=1:weightb=1:max−merge=4:mcstf=1:ref=3:open−gop=0:min−keyint=1:keyint=◯:fades=1:bframes=16:b−adapt=2:radl=2:hist−scenecut=1:b−intra=1:crf=16:crqpoffs=−5:cbqpoffs=−2:ipratio=1.6:pbratio=1.33:cu−lossless=1:psy−rdoq=2.5:rdoq−level=2:hevc−aq=1:aq−strength=1.4:qg−size=8:rd=5:limit−refs=0:rskip=0:rc−lookahead=◯:rect=1:amp=1:cutree=0:psy−rd=1.5:rdpenalty=2:qp−adaptation−range=5:deblock=−2:−2:limit−sao=1:sao−non−deblock=1:selective−sao=1:hash=2:allow−non−conformance=1:single−sei=1" −c:a copy ".\v_out.mp4"