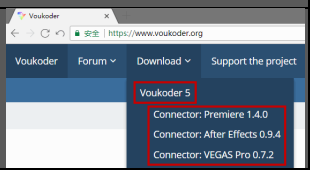
English version is derived from the x264 x265 Ultimate Tutorial Project by same author iAvoe

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:\]

[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.] C:\folder\ffmpeg.exe; [x265 build ver.] C:\folder\x265.exe -V

[CMD auto-filling] Write PATH/filename partially, and hit [Tab]

```
[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
```

Get source video metadata 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

Variable framerate: 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 number of frames÷encoding speed (fps)=required 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 --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        [script].vpy --y4m - | x265.exe - --y4m --output

VSpipe/avs2yuv    [script].vpy - | x265.exe --input-res [WxH] --fps [] - --output

avs2yuv.exe       [script].avs -raw - | x265.exe --input-res [WxH] --fps [] - --output
```

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)

ffmpeg multiplex all tracks (container format depends on output extension)

- ffmpeg.exe -i ".\v_in.hevc" -an -c:v copy -i ".\audio_in.aac" -c:a copy -i ".\subtitle_in.srt" -c:s copy "mux_out.mkv"
- ffmpeg.exe -i ".\v_in.hevc" -an -c:v copy -i ".\audio1.aac" -c:a copy -i ".\aud2.aac" -c:a copy -i ".\sub1.ass" -c:s copy -i ".\sub2.ass" -c:s copy "mux_out.mkv"

Subtitle support of different container formats: Wikipedia - Subtitle formats support

ffmpeg replace audio track, itoffset±seconds to align:

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

ffmpeg: small thread_queue_size warning:

- -thread_queue_size<(avg src bitrate kbps+1000)/usable CPU core cnt.>

Batch: keep CMD prompt on finish:cmd /k **+ show windows build version:**cmd -k

ffmpeg restore movie 24fps from NTSC 3:2 pulldown 60fps:

- ffmpeg.exe -i ".\60fps_interlaced_NTSC_source.vob" -map 0:v:0 -vf "fieldmatch=order=auto:mode=pc_n_ub:field=auto:cthresh=8:combmatch=full:blockx=16:bloc

ky=24:combpel=128,nnedi=weights=C:\download from here\nnedi3_weights.bin:field=af:nsize=s48x6:nns=n128:qual=slow:etype=mse:pscrn=new3" -fps 24 [other options]

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(maxCLL×10000,1)

bt709: G(15000,30000)B(7500,3000)R(32000,16500)WP(15635,16450)L(maxCLL×10000,1)

bt2020: G(8500,39850)B(6550,2300)R(35400,14600)WP(15635,16450)L(maxCLL×10000,1)

- 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)>

--max-cll <maxCLL,maxFALL>max, average pel intensity. Skip if MediaInfo doesn't get those values out

Color Primaries --colormatrix <as src, e.g.: gbr bt709 fcc bt470bg smpte170m YCgCo bt2020nc bt2020c smpte2084 ictcp>

--transfer <as source, e.g.: gbr bt709 fcc bt470bg smpte170m YCgCo bt2020nc bt2020c smpte2084 ictcp>

Dolby vision: DV-MEL (BL+RPU) & DV-FEL (BL+EL+RPU), x265 support 3 profiles of DV-MEL

Profile	Codec	BL:EL resolution	x265 supported	Gamma	Space
4	10bit hevc	1:1/4		SDR	YCbCr
5		BL only (DV-MEL)	✓		ICtCp
7		4K=1:1/4; 1920x1080=1:1		UHD BluRay	YCbCr
8.1		BL only (DV-MEL)	✓	HDR10	
8.2			✓	SDR	
8.4				HLG	
9	8bit avc	BL only (DV-MEL)		SDR	YCbCr

--dolby-vision-profile<select 5/8.1 (HDR10)/8.2>8.1 needs --master-display & --hdr10-opt

--dolby-vision-rpu<path>specify path to input RPU binary (.bin)

Encoding speed reference

Processor: R7 5800X all core 4.5Ghz OC, 67°C under FS140, avg 15440pts under CbR23 (PBO2 4.85Ghz minus 30 curve offset, 86°C under FC140, only raises 2%, thus unused)

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

src1: 1920x1080 yuv420p8 24000/1001fps 312MB low-Q h.264 film src, high contrast complex foreground texture, static low contrast background, 20238 frames. 10bit crf 28 adds depth error, low quality src reduces result difference, high contrast texture adds difficulty to MEMC

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

General: 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

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

src2: 3840x2160 yuv444p12 24fps 37GB PQ ProRes4444XQ src, high texture, 6314 frames. M: enlarge speed difference, check stability introduced by 4k12bit 4:4:4 high motion high texture difficult source. More difficult to encode than common high-budget anime

Gn-CRF16: 75m21s 1.4fps 1159MB, **CRF18:** 73m19s 1.44fps 902MB, **CRF20:** 69m58s 1.5fps 698MB, **CRF22:** failed halfway due to low stability, can be concatenated later

Note: hist-scenecut failed on all of them

src3: 1920x1080 yuv420p10 24000/1001fps 1.9GB h.264, 34095 frames. Detecting speed diff. from low-complexity, low budget anime source in 4:2:0

检测低成本动漫上, 4:2:0 的压制速度. (空间-时间复杂度简单的源)

Anime-HC: 46m43s, avg~12fps

src4: 1920x1080 yuv444p10 24000/1001fps 2.9GB h.264, 40920 frames. Detecting speed diff. from mid-complexity, high budget anime source in 4:4:4

检测高成本动漫, 4:4:4 上的压制速度. (空间-时间复杂度较为困难的源)

Anime-HC: 97m30s, avg~6.99fps

Gen-Purpose·Simple·LQ

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

splt-trans --preset slow

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/ -

multi node -dither)

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

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

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

(ffmpeg pipe) x265 CLI parameters

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\导入.mp4" -an -f yuv4mpegpipe -strict unofficial -pix_fmt<ffprobe pix_fmt> - | x265.exe --preset slow --me umh --subme 5 --merange 48 --weightb --aq-mode 4 --bframes 5 --ref 3 --hash 2 --allow-non-conformance --y4m - --output ".\输出.hevc"

libx265 CLI, compatible w/ libav fork

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -c:v libx265 -pix_fmt<ffprobe pix_fmt> -x265-params

"preset=slow: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)

- ffmpeg.exe -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"

ffmpeg multiplex all tracks (container format depends on output extension)

- ffmpeg.exe -i ".\v_in.hevc" -an -c:v copy -i ".\audio_in.aac" -c:a copy -i ".\subtitle_in.srt" -c:s copy "mux_out.mkv"
- ffmpeg.exe -i ".\v_in.hevc" -an -c:v copy -i ".\audio1.aac" -c:a copy -i ".\aud2.aac" -c:a copy -i ".\sub1.ass" -c:s copy -i ".\sub2.ass" -c:s copy "mux_out.mkv"

Subtitle support of different container formats: Wikipedia - Subtitle formats support

ffmpeg replace audio track, itoffset<±seconds> to align:

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

batch: back to normal CMD prompt when finish + show windows build version: cmd -k

Standard.

Lots of custom options for optimizations

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 <fast: --fast-intra / mid: leave blank / slow: --b-intra / slower: --constrained-intra >

quantization --crf <18~20 HQ 19 ~22 HD> --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 -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 --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.hevc"

libx265 CLI, compatible w/ libav fork

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -c:v libx265 -pix_fmt<ffprobe pix_fmt> -x265-params "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: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=0,-1:hash=2:allow-non-conformance=1" -c:a copy ".\v_out.hevc"

High Compression·Film·HQ Source

splt-trans --ctu 64 --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 --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 -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -an -f yuv4mpegpipe -strict unofficial -pix_fmt<ffprobe pix_fmt> - | x265.exe --ctu 64 --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 --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:-1 --limit-sao --sao-non-deblock --selective-sao 3 --hash 2 --allow-non-conformance --y4m - --output ".\v_out.hevc"

libx265 CLI, compatible w/ libav fork

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -c:v libx265 -pix_fmt <ffprobe pix_fmt> -x265-params "ctu=64: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: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,-1:limit-sao=1:sao-non-deblock=1:selective-sao=3:hash=2:allow-non-conformance=1" -c:a copy ".\v_out.hevc"

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 --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 -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 --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.hevc"

libx265 CLI, compatible w/ libav fork

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -c:v libx265 -pix_fmt<ffprobe pix_fmt> -x265-params "ctu=32:me=star:subme=◯:merange=48:analyze-src-pics=1:max-merge=4:early-skip=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 --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 -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 --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 --y4m - --output ".\v_out.hevc"

libx265 CLI, compatible w/ libav fork

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -c:v libx265 -pix_fmt<ffprobe pix_fmt> -x265-params "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: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" -c:a copy ".\v_out.mp4"

Anime·ripper's cold war·HEDT+HQ Src 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 --b-intra

quantization --crf 17.1 --crqpoffs -5 --cbqpoffs -2 --ipratio 1.67 --pbratio 1.33 --cu-lossless

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

aq <std. x265: --hevc-aq --aq-strength 1.4; Jpsdr mod: --aq-auto 10 --aq-bias-strength 1.3 --aq-

md strength-edge 1.4 --aq-bias-strength 1.1> --qg-size 8

--rd 5 --limit-refs 0 --rskip 2 --rskip-edge-threshold 3 --rc-lookahead <2.5 × fps> --rect

rdo --amp --no-cutree

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

sao --deblock -2:-2

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

(ffmpeg pipe) std. x265 CLI parameters

- ffmpeg.exe -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 --b-intra --crf 17.1 --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 2 --rskip-edge-threshold 3 --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 --y4m - --output ".\v_out.hevc"

(ffmpeg pipe) jpsdr mod x265 CLI parameters

- ffmpeg.exe -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 --b-intra --crf 17.1 --crqpoffs -5 --cbqpoffs -2 --ipratio 1.67 --pbratio 1.33 --cu-lossless --psy-rdoq 2.5 --rdoq-level 2 --aq-auto 10 --aq-bias-strength 1.3 --aq-strength-edge 1.4 --aq-bias-strength 1.1 --qg-size 8 --rd 5 --limit-refs 0 --rskip 2 --rskip-edge-threshold 3 --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 --y4m - --output ".\v_out.hevc"

std. libx265 CLI, compatible w/ libav fork

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -c:v libx265 -pix_fmt<ffprobe pix_fmt> -x265-params "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:b-intra=1:crf=17.1: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=2:rskip-edge-threshold=3: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" -c:a copy ".\v_out.mp4"