cdf_storage_reduction

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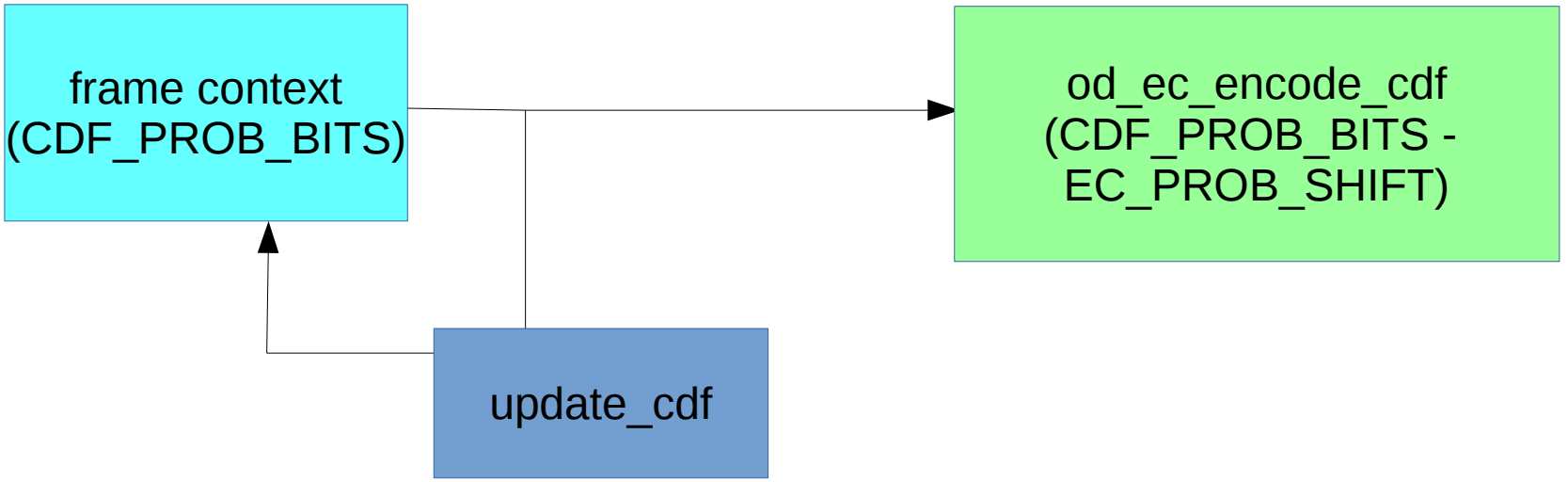
Precision locations



CDF_PROB_BITS = 15
EC_PROB_SHIFT = 6
EC CDF precision = CDF_PROB_BITS – EC_PROB_SHIFT = 9
(15 – CDF_PROB_BITS) + EC_PROB_SHIFT >= 7
(if exactly 7, saves a shift in software)

CDF_PROB_BITS

- Shrinks size of multipliers in update_cdf
- Decreases storage required for context (slightly)
- Makes adaptation worse (adaptation is slow so quantization error becomes significant)

Option 1

- CDF_PROB_BITS = 14 (reduced by 1)
- CDF_PROB_SHIFT = 6
- https://beta.arewecompressedyet.com/?job=cdf_prob_bits_15-3&job=cdf_prob_bits_14-3

Video	PSNR	PSNR HVS	SSIM	CIEDE 2000
Average	0.21	0.17	0.24	0.13
1080p	0.16	0.15	0.19	0.06
1080p-screen	-0.15	-0.16	0.01	-0.19
360p	0.38	0.35	0.38	0.39
720p	0.30	0.21	0.31	0.20

Option 2

- CDF_PROB_BITS=14 (reduced by 1)
- CDF_PROB_SHIFT=5 (reduced by 1, increases final CDF precision to 10 bits)

Video	PSNR	PSNR HVS	SSIM	CIEDE 2000
Average	0.13	0.12	0.16	0.11
1080p	0.15	0.14	0.20	0.10
1080p-screen	-0.36	-0.24	-0.21	-0.44
360p	0.23	0.21	0.31	0.27
720p	0.28	0.18	0.13	0.30

Option 3

- CDF_PROB_BITS=13 (reduced by 2)
- CDF_PROB_SHIFT=5 (reduced by 1, increases final CDF precision to 10 bits)

Video	PSNR	PSNR HVS	SSIM	CIEDE 2000
Average	0.49	0.42	0.59	0.30
1080p	0.58	0.56	0.73	0.41
1080p-screen	0.14	-0.00	0.25	-0.22
360p	0.50	0.42	0.57	0.43
720p	0.55	0.45	0.55	0.30

Summary

Option	Storage bits	EC bits	PSNR loss
Baseline	15	9	0
Option 1	14	9	0.21
Option 2	14	10	0.15
Option 3	13	10	0.49