

AHG16/NON-CE7: A STUDY OF BIN TO BIT RATIO FOR VTM6.0 (JVET-P0050)



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Collected Data and Decoder Side Measurements

- **Data collected from the decoder side:**
 - The peak context coded bin rate, bypass bin rate and bit-rate of a coded sequence.
 - The average context coded bin rate, bypass bin rate and bit-rate over a coded sequence.
 - The average context coded bin rate, bypass bin rate and bit-rate consumed by the transform coefficients coding over a coded sequence.
- **Measurements:**
 - Weighted BD-binrate for the peak case.
 - Weighted BD-binrate for the average case.
 - Weighted BD-binrate for the transform coefficients coding part.
 - Weighted bin to bit ratio for the peak case.
 - Un-weighted bin to bit ratio for the peak case, for the average case, and for the transform coefficients coding part.

Note: In the weighted measurements, a bypass bin is counted as 0.25 context coded bins. In the un-weighted measurements, a bypass bin and a context coded bin carry an equal weight (1:1). All the percentage numbers are computed against HM16.19.

Summary Results (Weighted Bin to Bit Ratio)

- As far as the low-QP AI is concerned, the VTM6.0 weighted bin to bit ration is about 18% higher than that of HM16.19.

Bin2bit ratio (peak, weighted)										
	HM16.19	VTM4.0	VTM5.0	VTM6.0	diff (%, VTM4.0 vs. HM16.19)	diff (%, VTM5.0 vs. HM16.19)	diff (%, VTM6.0 vs. HM16.19)	diff* (%, VTM5.0 vs. VTM4.0)	diff* (%, VTM6.0 vs. VTM5.0)	diff* (%, VTM6.0 vs. VTM4.0)
QP = (22, 27, 32, 37), CTC										
AI	0.95	1.10	1.13	1.14	15.72%	19.71%	19.89%	3.99%	0.18%	4.17%
RA	0.93	1.09	1.12	1.13	17.39%	20.88%	21.70%	3.49%	0.82%	4.31%
LDB	0.96	1.09	1.13	1.13	13.34%	16.99%	17.14%	3.64%	0.16%	3.80%
LDP	0.96	1.09	1.13	1.13	13.24%	17.30%	17.21%	4.06%	-0.09%	3.97%
QP = (2, 7, 12, 17), 100 frames										
AI	0.79	0.94	0.95	0.93	18.11%	20.24%	17.71%	2.12%	-2.53%	-0.40%
RA	0.74	0.87	0.88	0.86	17.17%	19.00%	15.15%	1.83%	-3.85%	-2.02%
LDB	0.78	0.92	0.93	0.92	17.67%	19.67%	17.73%	2.00%	-1.94%	0.06%
LDP	0.78	0.92	0.93	0.92	17.46%	19.46%	17.52%	2.00%	-1.94%	0.06%
Note*: Percentage difference is measured against HM16.19										

Summary Results (Un-weighted Bin to Bit Ratio)

- As far as the low-QP AI is concerned, the VTM6.0 un-weighted bin to bit ration is about 10% higher than that of HM16.19.

Bin2bit ratio (peak, unweighted)										
	HM16.19	VTM4.0	VTM5.0	VTM6.0	diff (%, VMT4.0 vs. HM16.19)	diff (%, VMT5.0 vs. HM16.19)	diff (%, VMT6.0 vs. HM16.19)	diff* (%, VMT5.0 vs. VTM4.0)	diff* (%, VMT6.0 vs. VTM5.0)	diff* (%, VMT6.0 vs. VTM4.0)
QP = (22, 27, 32, 37), CTC										
AI	1.23	1.38	1.40	1.38	12.38%	14.21%	12.91%	1.82%	-1.30%	0.53%
RA	1.21	1.38	1.40	1.39	13.75%	15.25%	14.36%	1.50%	-0.89%	0.61%
LDB	1.24	1.37	1.39	1.38	11.25%	12.88%	11.57%	1.63%	-1.30%	0.32%
LDP	1.23	1.37	1.39	1.38	11.08%	13.02%	11.49%	1.94%	-1.53%	0.42%
QP = (2, 7, 12, 17), 100 frames										
AI	1.19	1.31	1.33	1.31	10.45%	11.40%	9.85%	0.95%	-1.55%	-0.60%
RA	1.18	1.28	1.28	1.27	7.63%	8.39%	6.87%	0.76%	-1.52%	-0.76%
LDB	1.18	1.30	1.31	1.29	9.54%	10.28%	8.98%	0.74%	-1.30%	-0.56%
LDP	1.18	1.30	1.31	1.29	9.50%	10.24%	8.94%	0.74%	-1.30%	-0.56%
Note*: Percentage difference is measured against HM16.19										

Observations

- The bin to bit ratio has gone down from VTM5.0 to VTM6.0.
- As far as low-QP AI configuration is concerned, the weighted and un-weighted bin to bit ratio of the VTM6.0 is roughly 18% and 10% higher than that of VTM16.19, respectively.