



AHG6/AHG9: Cleanups and fixes for APS

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Overall Summary

- Cleanups of APS source code
 - Non-normative
 - Pure HM software cleanup without BD-rate change
- Send an APS only when ALF is enabled for the picture
 - Non-normative and encoder-only

	AI	RA	LD-B	LD-P
Main	0%	-0.1%	-0.2%	-0.2%
HE10	0%	0%	-0.1%	-0.1%

- Send `aps_id` in slice header only when ALF is enabled for the slice
 - Normative
 - Average no BD-rate difference

Cleanups of APS Source Code

- Non-normative modification
- Pure source code cleanup for HM
 - Remove code dependencies between APS and SAO
 - Aligned buffer management for APS on both encoder and decoder sides.
- No BD-rate change

Send an APS only when ALF Is enabled for the picture

- In current HM, APS is always sent for each picture
 - Even when ALF is disabled
- Proposed non-normative encoder-only modification
 - If all of the following conditions are true, an APS is sent for the picture
 - SPS: adaptive_loop_filter_enabled is true
 - Slice header: slice_alf_flag[0], slice_alf_flag[1], or slice_alf_flag[2] is true

	AI	RA	LD-B	LD-P
Main	0%	-0.1%	-0.2%	-0.2%
HE10	0%	0%	-0.1%	-0.1%

Send `aps_id` in slice header only when ALF is enabled for the slice

- Avoid sending `aps_id` when ALF is disabled in the slice.

	Descriptor
<code>slice_header() {</code>	
<code>.....</code>	
<code>if(adaptive_loop_filter_enabled_flag)</code>	
<code>aps_id</code>	<code>ue(v)</code>
<code>.....</code>	
<code>if(adaptive_loop_filter_enabled_flag) {</code>	
<code>for(cIdx = 0; cIdx < 3; cIdx++)</code>	
<code>slice_alf_flag[cIdx]</code>	<code>u(1)</code>
<code>if(slice_alf_flag[0] slice_alf_flag[1] slice_alf_flag[2])</code>	
<code>aps_id</code>	<code>ue(v)</code>
<code>}</code>	
<code>.....</code>	
<code>}</code>	

- Average no BD-rate change

Conclusion

- Two non-normative modifications
 - Cleanups of APS source code
 - No impact on results
 - Send an APS only when ALF is enabled for the picture
 - BD-rate = -0.1%
- One normative modification
 - Send an `aps_id` in the slice header only when ALF is enabled for the slice
 - BD-rate = 0%