



JCTVC-L0179: Output flag location

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Introduction

- **In SVC, output_flag is in the NAL unit header**
 - When value of output_flag is 0, decoder should decode NAL unit, but not output the associated picture
- **Use cases described in JVT-W047r1, including thinning of bitstream by a middle box**
 - Requires middle box to sometimes switch the value of the flag
- **In HEVC, pic_output_flag is conditionally present in the slice segment header, based upon presence flag in PPS, and follows VLC-coded data**
 - Difficult for middle box to change value of the flag
 - Must maintain state from PPS to know flag is present
 - Must decode VLC data
 - May introduce error in current NAL unit when switching value of flag, if flag not present
- **Two options proposed to change output_flag location**

Option 1: Slice segment header

- Move **pic_output_flag** earlier in the slice segment header, before any VLC coded syntax elements
- Make **pic_output_flag** always present, and remove **output_flag_present_flag** from the PPS

slice_segment_header() {	Descriptor
first_slice_segment_in_pic_flag	u(1)
pic_output_flag	u(1)
if(RapPicFlag)	
no_output_of_prior_pics_flag	u(1)
pic_parameter_set_id [Ed. (GJS): Violates syntax element naming convention by havin the same name as a syntax element in the picture parameter set.]	ue(v)
if(!first_slice_segment_in_pic_flag) {	
if(dependent_slice_segments_enabled_flag)	
dependent_slice_segment_flag	u(1)
slice_segment_address	u(v)
}	
if(!dependent_slice_segment_flag) {	
for (i = 0; i < num_extra_slice_header_bits; i++)	
slice_reserved_undetermined_flag[i]	u(1)
slice_type	ue(v)
if(output_flag_present_flag)	-
pic_output_flag	u(1)
if(separate_colour_plane_flag == 1)	
colour_plane_id	u(2)
...	

Option 2: SEI Message

- **Create a no display SEI message**
 - Remove pic_output_flag syntax element from slice segment header and output_flag_present_flag from the PPS
 - Where value of PicOutputFlag variable depends upon pic_output_flag, replace by 1, e.g. pic_output_flag is always 1
 - Distinguishes between output (which affects HRD) and display (which does not affect HRD)
 - Proposed SEI message may have no payload, and applies to current access unit only, without persistence. May be repeated in access unit.

No display SEI message

sei_payload(payloadType, payloadSize) {	Descriptor
if(nal_unit_type == PREFIX_SEI_NUT)	
if(payloadType == 0)	
buffering_period(payloadSize)	
...	
<u>else if(payloadType == 135)</u>	
<u>no_display(payloadSize)</u>	
...	

<u>no_display(payloadSize) {</u>	Descriptor
<u>}</u>	

D.2.25 No display SEI message semantics

The no display SEI message indicates that the current picture should not affect the content of the display.

Semantics change to 8.1 General decoding process

PicOutputFlag is set as follows:

- If the current picture is a RASL picture and the previous RAP picture in decoding order is a BLA picture or is a CRA picture that is the first coded picture in the bitstream, PicOutputFlag is set equal to 0.
- Otherwise, PicOutputFlag is set equal to pic_output_flag1.

Option 3: Slice segment header variant

- In discussion during the initial presentation, a variant on the first option was suggested
- Move `pic_output_flag` earlier in the slice segment header, before any VLC coded syntax elements
- Make `pic_output_flag` always present in first slice segment of picture, and remove `output_flag_present_flag` from the PPS

slice_segment_header() {	Descriptor
first_slice_segment_in_pic_flag	u(1)
<u>if (first_slice_segment_in_pic_flag)</u>	
<u>pic_output_flag</u>	<u>u(1)</u>
...	

Conclusion

- **Current location of `pic_output_flag` is burdensome for middle box to switch its value**
- **Consider three alternative options to change location of output flag, to simplify operation of middle box**
 - Option 1: Slice segment header
 - Option 2: SEI message
 - Option 3: Slice segment header variant