

JCTVC-N0119/JCT3V-E0090
MV-HEVC/SHVC HLS: On collocated picture
indication

Hahyun Lee

Problem Statement

❑ SHVC WD2.0 and MV-HEVC WD 4.0

slice_segment_header() {	
...	
if(slice_temporal_mvp_enabled_flag) {	
if(nuh_layer_id > 0 && NumActiveMotionPredRefLayers > 0)	
alt_collocated_indication_flag	u(1)
if(alt_collocated_indication_flag)	
if(NumActiveMotionPredRefLayers > 1)	
collocated_ref_layer_idx	ue(v)
else {	
if(slice_type == B)	
collocated_from_l0_flag	u(1)
if((collocated_from_l0_flag && num_ref_idx_l0_active_minus1 > 0) (!collocated_from_l0_flag && num_ref_idx_l1_active_minus1 > 0))	
collocated_ref_idx	ue(v)
}	
}	
...	
}	

- ❖ As current draft text does not specify the syntax element ‘collocated_from_l0_flag’, when ‘alt_collocated_indication_flag’ is equal to 1, there are following problems
 - When current slice is B slice, **it is not possible to know whether a collocated picture is derived from reference picture list 0 or reference picture list 1.**
 - **‘collocated_from_l0_flag’ is used to derive collocated motion vectors**
 - Both predFlagL0Col[xColPb][yColPb] and predFlagL1Col[xColPb][yColPb] are equal to 1
 - Low delay condition (DiffPicOrderCnt(aPic, currePic) is less than or equal to 0 for every picture aPic in every reference picture list of the current slice) is not true.

Proposed solutions

❑ Alternative 1

❖ The syntax element ‘collocated_from_l0_flag’ is moved.

slice_segement_header() {	
if(slice_temporal_mvp_enabled_flag) {	
if(slice_type == B)	
collocated_from_l0_flag	
if(nuh_layer_id > 0 && NumActiveMotionPredRefLayers > 0)	
alt_collocated_indication_flag	u(1)
if(nuh_layer_id > 0 && alt_collocated_indication_flag) {	
if(NumActiveMotionPredRefLayers > 1)	
collocated_ref_layer_idx	ue(v)
else {	
if(slice_type == B)	-
collocated_from_l0_flag	u(1)
if((collocated_from_l0_flag && num_ref_idx_l0_active_minus1 > 0) (!collocated_from_l0_flag && num_ref_idx_l1_active_minus1 > 0))	
collocated_ref_idx	ue(v)
}	
}	
}	

Proposed solutions

□ Alternative 1

❖ According to the syntax change, **the decoding process for temporal luma motion vector prediction is changed.**

▪ G.8.5.3.2.7 / G.8.5.1 Derivation process for temporal luma motion vector prediction

5. Depending on the values of `alt_collocated_indication_flag`, `collocated_ref_layer_idx`, `slice_type`, `collocated_from_l0_flag`, and `collocated_ref_idx`, the variable `colPic`, specifying the collocated picture, is derived as follows:

~~— If `alt_collocated_indication_flag` is equal to 1, `colPic` is set equal to the picture in the current access unit with `nuh_layer_id` equal to `ActiveMotionPredRefLayerId[collocated_ref_layer_idx]`.~~

– If `alt_collocated_indication_flag` is equal to 1 and `slice_type` is equal to B and `collocated_from_l0_flag` is equal to 0, `colPic` is set equal to the picture in the `RefPicList1` with `nuh_layer_id` equal to `ActiveMotionPredRefLayerId[collocated_ref_layer_idx]`.

– otherwise (`alt_collocated_indication_flag` is equal to 1 and `slice_type` is equal to B and `collocated_from_l0_flag` is equal to 1 or `slice_type` is equal to P), `colPic` is set equal to the picture in the `RefPicList0` with `nuh_layer_id` equal to `ActiveMotionPredRefLayerId[collocated_ref_layer_idx]`.

– Otherwise, if `slice_type` is equal to B and `collocated_from_l0_flag` is equal to 0, `colPic` is set equal to `RefPicList1[collocated_ref_idx]`.

1. Otherwise (`slice_type` is equal to B and `collocated_from_l0_flag` is equal to 1 or `slice_type` is equal to P), `colPic` is set equal to `RefPicList0[collocated_ref_idx]`.

Proposed solutions

□ Alternative 2

❖ Compare to draft text, only semantic of ‘alt_collocated_indication_flag’ is changed

slice_segment_header() {	
...	
if(slice_temporal_mvp_enabled_flag) {	
if(nuh_layer_id > 0 && NumActiveMotionPredRefLayers > 0)	
alt_collocated_indication_flag	u(1)
if(alt_collocated_indication_flag)	
if(NumActiveMotionPredRefLayers > 1)	
collocated_ref_layer_idx	ue(v)
else {	
if(slice_type == B)	
collocated_from_l0_flag	u(1)
if((collocated_from_l0_flag && num_ref_idx_l0_active_minus1 > 0) (!collocated_from_l0_flag && num_ref_idx_l1_active_minus1 > 0))	
collocated_ref_idx	ue(v)
}	
}	
...	
}	

- **alt_collocated_indication_flag** equal to 0 specifies that a collocated picture for temporal motion vector prediction is indicated by collocated_from_l0_flag, when present, and collocated_ref_idx. alt_collocated_indication_flag equal to 1 specifies that a collocated picture for temporal motion vector prediction is indicated by collocated_ref_layer_idx. When alt_collocated_indication_flag is not present, it is inferred to be equal to 0. When alt_collocated_indication_flag is equal to 1, collocated_from_l0_flag is inferred to be equal to 1.

Proposed solutions

□ Alternative 2

❖ According to the semantic change, **the decoding process for temporal luma motion vector prediction** is changed.

- G.8.5.3.2.7 / G.8.5.1 Derivation process for temporal luma motion vector prediction

5. Depending on the values of `alt_collocated_indication_flag`, `collocated_ref_layer_idx`, `slice_type`, `collocated_from_10_flag`, and `collocated_ref_idx`, the variable `colPic`, specifying the collocated picture, is derived as follows:

~~— If `alt_collocated_indication_flag` is equal to 1, `colPic` is set equal to the picture in the current access unit with `nuh_layer_id` equal to `ActiveMotionPredRefLayerId[collocated_ref_layer_idx]`.~~

– If `alt_collocated_indication_flag` is equal to 1, `colPic` is set equal to the picture in the `RefPicList0` with `nuh_layer_id` equal to `ActiveMotionPredRefLayerId[collocated_ref_layer_idx]`.

– Otherwise, if `slice_type` is equal to B and `collocated_from_10_flag` is equal to 0, `colPic` is set equal to `RefPicList1[collocated_ref_idx]`.

1. Otherwise (`slice_type` is equal to B and `collocated_from_10_flag` is equal to 1 or `slice_type` is equal to P), `colPic` is set equal to `RefPicList0[collocated_ref_idx]`.