

HLS:

Extensions to Motion-constrained tile sets SEI message

JCTVC-N0117

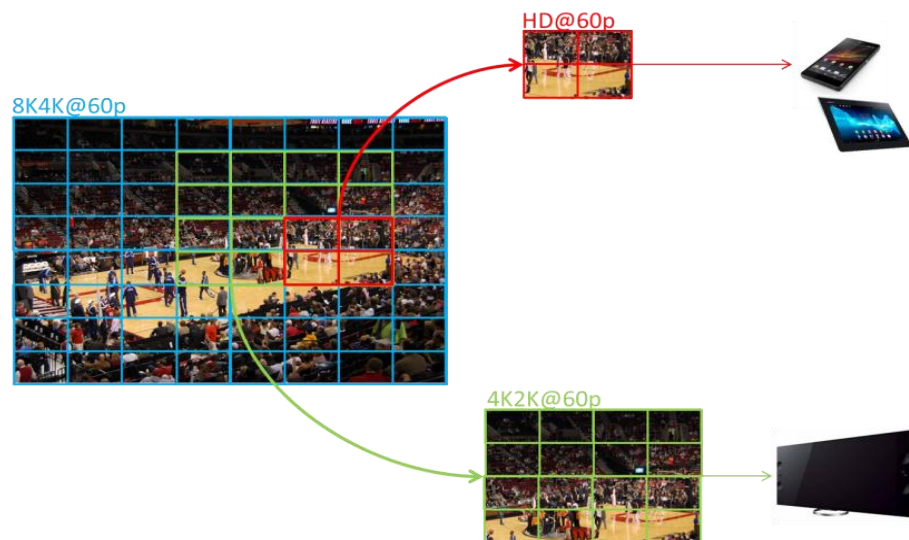
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Background

- Recent advent of higher resolution capture devices and wide variety of display devices anticipates applications to become capable of spatial adaptation.
- Tiled Streaming Application
 - An application concept in which a high resolution video is split in independent videos that would compose a full panorama
 - Several videos can compose multiple layers of video at various resolutions of the panorama which are streamed to devices with various display resolutions
- Characteristics/Requirements
 - Switching of tiles to be decoded/displayed
 - The switching region (one or more tile sets) must be independently decodable – all tile may be independently decodable
- **Solution: HEVC Tile structure with usage of Motion-constrained tile set SEI message can be applied.**

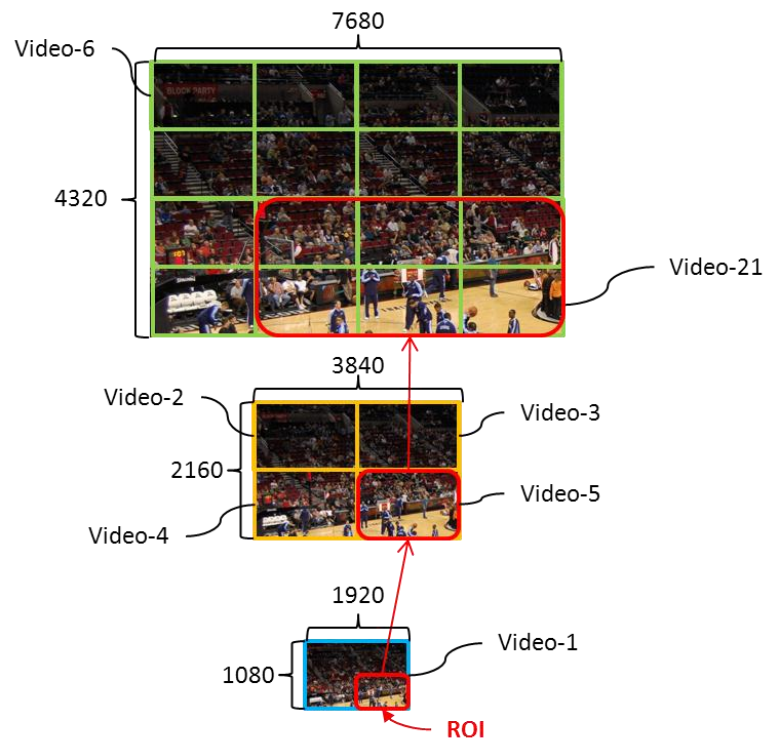
Tiled Streaming Application Image

Example 1:



The region to be streamed & displayed(decoded) varies depending on the display devices. The region can be switched based on user interaction(preference) – similar to ROI.

Example 2:



When the ROI is selected, the streamed video switches to higher resolution of the same region to prevent degrading the resolution of ROI.

Proposal

- Propose to define tile based “level” indication
- Extend Motion-constrained tile set SEI (MCTS SEI)
- Proposed Syntax & Semantics

motion_constrained_tile_sets(payloadSize) {	Descriptor
num_sets_in_message_minus1	ue(v)
for(i = 0; i <= num_sets_in_message_minus1; i++) {	
mcts_id[i]	ue(v)
num_tile_rects_in_set_minus1[i]	ue(v)
for(j = 0; j <= num_tile_rects_in_set_minus1[i]; j++) {	
top_left_tile_index[i][j]	ue(v)
bottom_right_tile_index[i][j]	ue(v)
}	
exact_sample_value_match_flag[i]	u(1)
mcts_level_idc[i]	ue(v)
}	
}	

The semantics of the syntax element **mcts_level_idc[i]** is the same as the syntax element **general_level_idc** but it is applied to the i-th identified motion-constrained tile set.

Conclusion

- The extension to a motion-constrained tile sets SEI message is proposed to signal a **level indication** for **motion-constrained tile set**.
- The proposal provides flexibility of HEVC tile structure to be applied for various applications, such as tiled streaming applications.



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