

# AHG9: Thread entry points SEI message

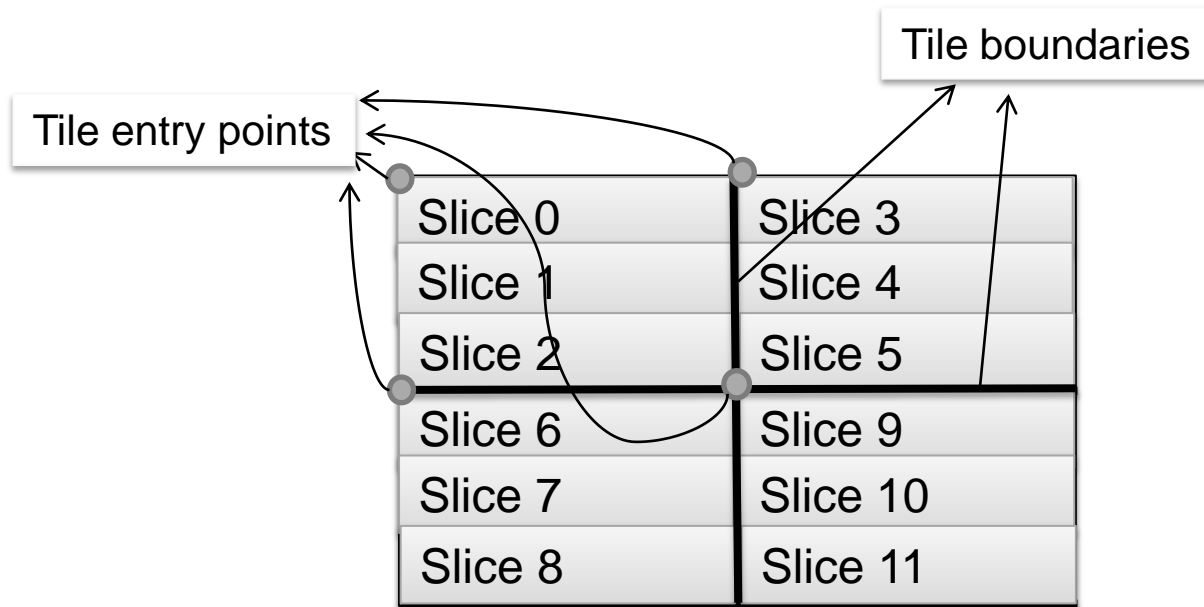
**JCTVC-K0200\_r1**

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# Problem statement

- In HM8.0, sub-stream entries are signaled in slice header when
  - When e.g. a slice contains multiple of tiles
  - Aimed to facilitate sub-stream switching in a single core decoder when processing is in picture-based raster scanning order
- No sub-stream entry points info is present in the bitstream
  - When e.g. a picture is divided into tiles, and a tile contains multiple slices



# Thread entry points SEI message (1)

- Signaled at picture-level (similar to JVTVC-J0081)
- Facilitate parallel decoding in environments in which encoder and decoder negotiation might be possible
- Provide extensibility of supporting parallel decoding in which parallel tools might need to be mandated
- **Syntax**

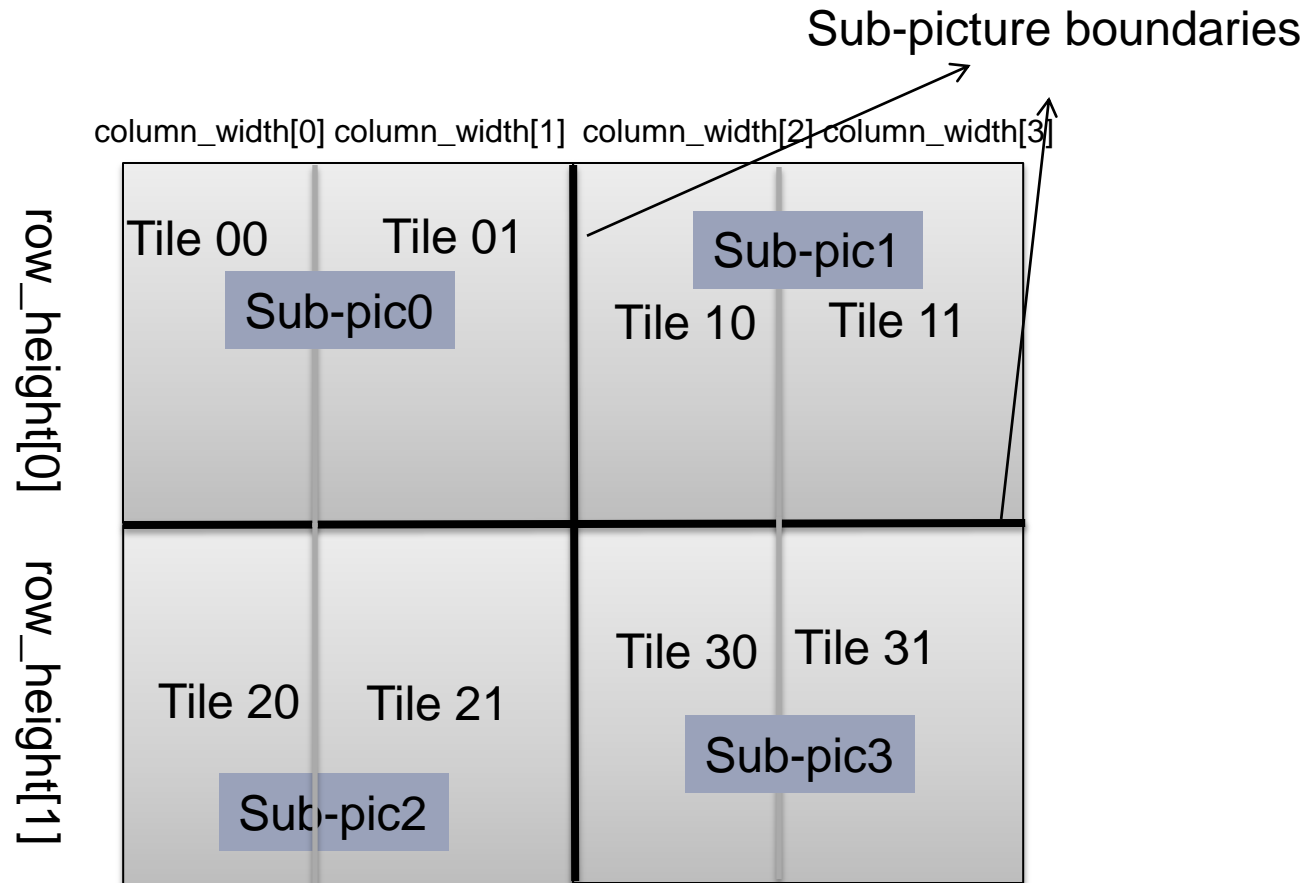
thread_entry_points( payloadSize) {	<b>Descriptor</b>
num_thread_entry_point_offsets_minus1	ue(v)
if(num_thread_entry_point_offsets_minus1 > 0 ) {	
thread_uniform_spacing_flag	u(1)
offset_len_minus1	ue(v)
for( i = 0; i < num_thread_entry_point_minus1; i++ )	
thread_entry_point_offset[ i +1]	u(v)
}	

# Thread entry points SEI message (2)

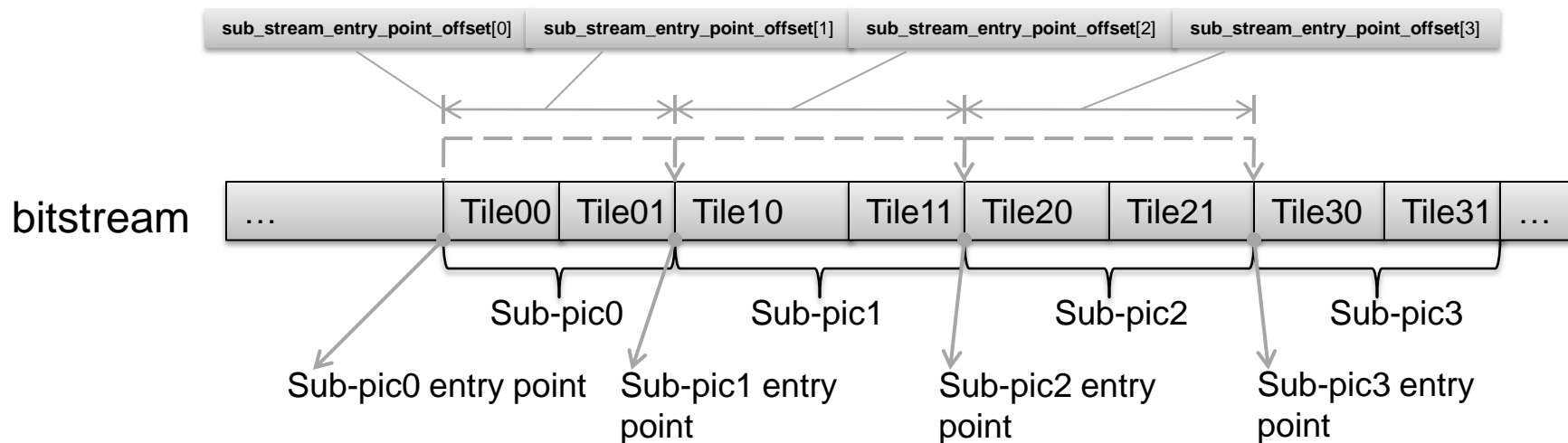
- Each thread shall start with a slice header with `dependent_slice_flag` set equal to 0.
- **Semantics**
  - `num_sub_stream_entry_point_offsets_minus1` is the number of entry points minus 1
  - `thread_uniform_spacing_flag` indicates whether sub-streams are uniformly spaced in terms of CTBs
  - `offset_len_minus1` plus 1 specifies the length, in bytes, of the entry points
  - `thread_entry_point_offset` [i+1] specifies the entry point offsets, in bytes

# Example – picture partitioning

- A picture is evenly divided into four sub-pictures with tiles



# Example – SEI message signaling



- **num\_thread\_entry\_point\_offsets\_minus1** is set to 3
- **thread\_uniform\_spacing\_flag** is set to 1
- **thread\_entry\_point\_offset[0]** is inferred to 0 (not present in bitstream)
- **thread\_entry\_point\_offset[1]** is set equal to the bitstream size of sub-picture 0
- **thread\_entry\_point\_offset[2]** is set equal to the bitstream size of sub-picture 1
- **thread\_entry\_point\_offset[3]** is set equal to the bitstream size of sub-picture 2

# Conclusions

- The current design does not have a mechanism to signal thread entry points at picture-level to facilitate parallel decoding
- Recommend to add the SEI message based signaling to the spec