

# JCTVC-080: On NAL unit header

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# 3 proposals and 1 discussion

## ▣ 3 proposals

- ▣ To save one bit from nal\_ref\_idc
- ▣ To include temporal\_id in SEI NAL unit header
- ▣ To indicate anchor picture in NAL unit header

## ▣ 1 discussion

- ▣ Indication of intra picture in NAL unit header

# Save one bit from nal\_ref\_idc

- **Currently use 2 bits**

- Semantics currently missing in the WD, but in spirit should be the same as in AVC
  - Greater than 0: reference picture (or SPS, PPS)
  - 0: non-reference picture (or SEI, etc.)

- **No difference specified in AVC/SVC/MVC and HEVC WD1 for values 1, 2, and 3**

- Only known use is in AVC RTP payload format: a greater value indicates a higher transport priority
- And the use deprecated in SVC RTP payload

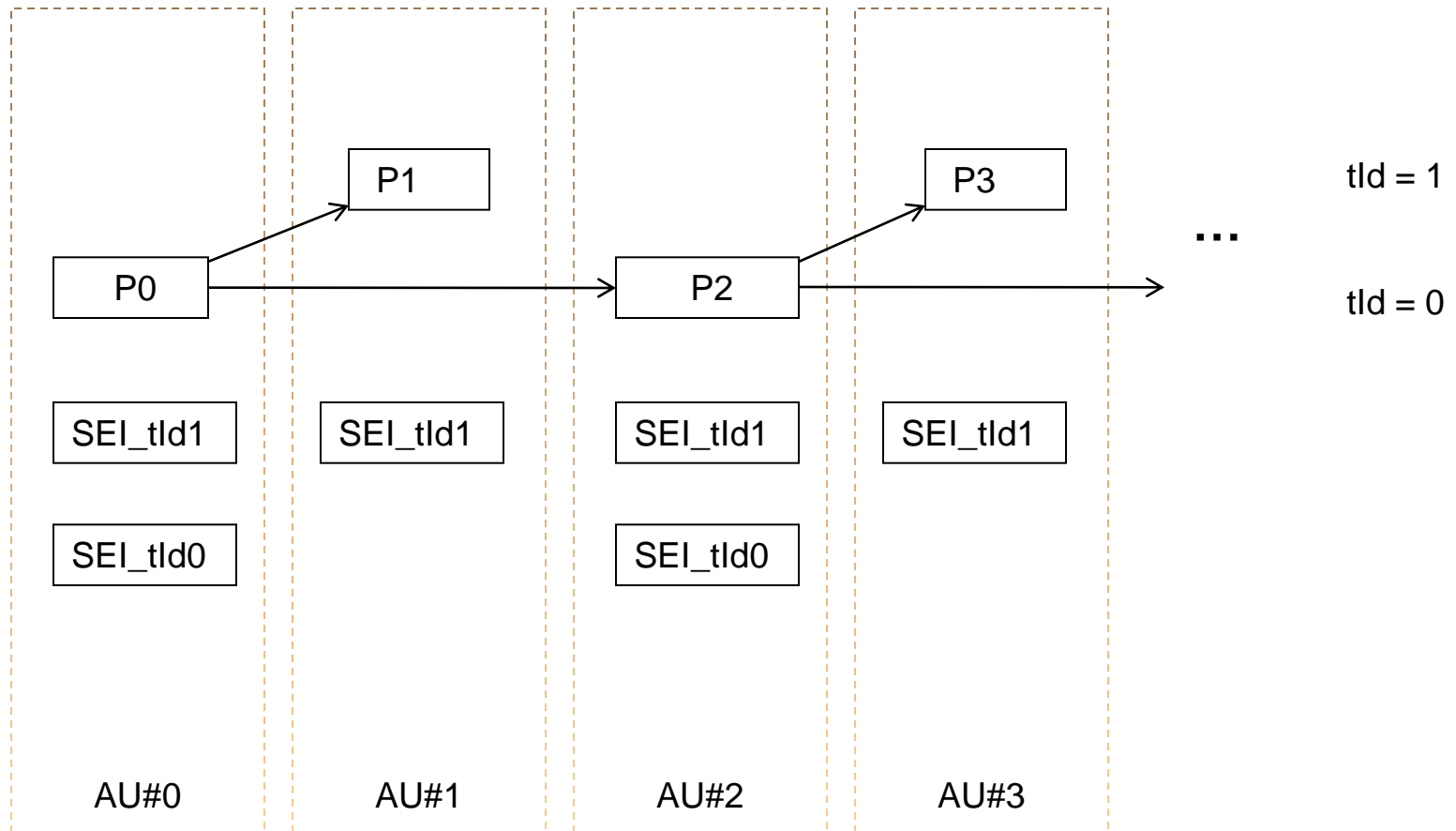
- **Proposal**

- nal\_ref\_idc (2 bits) -> nal\_ref\_flag (1 bit)
- The saved bit to “reserved”, or to make nal\_unit\_type from 5 bit to 6 bits

# temporal\_id in SEI NAL unit header

- **Currently present in NAL unit header for VCL NAL units (NUT 1 or 5)**
- **There may be temporal subset specific SEI messages, such as buffering period SEI message**
  - See an example in next slide
- **One way to support temporal subset specific SEI messages is to reuse the scalable nesting SEI message in SVC**
  - Syntax needs change, e.g. removing dependency\_id and quality\_id
  - temporal\_id included inside the scalable nesting SEI message
- **Proposal**
  - Include temporal\_id in NAL unit header also for SEI NAL units, i.e. when NUT = 1, 5, or 6
  - Compared to reusing scalable nesting SEI message
    - A cleaner design with considering backward compatibility to AVC
    - Bitstream extraction becomes easier as temporal\_id is found in the NAL unit header

## An example of temporal subset specific SEI message



# Anchor picture indication in NAL unit header

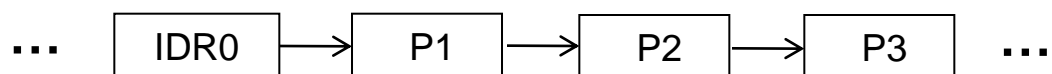
## □ Background

- Three types of random access points (RAPs) – see also next slide
  - IDR pictures
  - Anchor pictures (i.e. open-GOP intra pictures)
  - GDR (gradual decoding refresh) pictures
- Signaling of RAPs
  - IDR – NUT 5
  - Anchor and GDR – recovery point SEI message
    - In MVC, a flag in NAL unit header MVC extension is used for the indication
- For improved coding efficiency, many video bitstreams do not contain many IDR pictures, but rely on anchor pictures to provide random accessibility
  - E.g. hierarchical B coding structure, traditional IBBP structure
- Including anchor picture indication in NAL unit header is beneficial application systems, e.g. video streaming, as identification and location of RAPs would become simpler

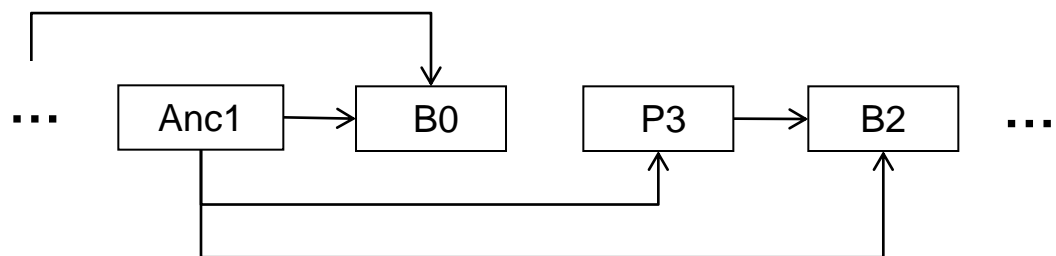
## □ Proposal

- Using one bit in NAL unit header as a flag to indicate anchor pictures, similar as in MVC
- An alternative is to use a new NUT. However, it seems that using a flag would be better

# Types of random access points (RAPs)



IDR0 is an IDR RAP



Anc1 is an anchor RAP



GDR0 is an GDR RAP

→  
decoding order

Note: The number in each box indicates relative output order

# Intra picture indication in NAL unit header?

- **Currently to identify all intra pictures, the following may need to be checked (i.e. parsing into slice header of all slices of picture may be needed)**
  - NUT equal to 5?
  - slice\_type to 2 for all slices in the coded picture?
  - The access unit contains an access unit delimiter and the primary\_pic\_type is equal to 0?
- **Streaming and other applications may use intra pictures for fast forward and rewind trick modes**
- **Therefore, inclusion of intra picture indication in NAL unit header would be helpful**
- **Should we include indication of intra pictures in NAL unit header?**
  - Again, use a flag or a new NUT (the former seems to be better)



# Thank you

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