



JCTVC-K0205:TL0 index SEI message

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Introduction

- **Propose a TL0_index SEI message for the HEVC base specification**
 - For improved error resiliency when temporal scalability is used
 - Syntax and semantics similar to the SVC tl0_dep_rep_index SEI message, revised to better align with the HEVC base specification design
- **Revision reflects discussion at presentation at High-level syntax AHG**

Differences from SVC tl0_dep_rep_index SEI



• **Semantics**

- Use RAPs rather than IDRs to reset the TL0 value to 0
- Remove references to `idr_pic_id`, which is not included in HEVC
- Remove references to `dependency_id`, because spatial scalability is not included in base HEVC

• **Syntax**

- Use 8 bits rather than 16 bits for `rap_idx`

Syntax

- **Proposed syntax**

<code>tl0_index(payloadSize) {</code>	C	Descriptor
<code>tl0_idx</code>	5	u(8)
<code>rap_idx</code>	5	u(8)
<code>}</code>		

- **SVC syntax**

<code>tl0_dep_rep_index(payloadSize) {</code>	C	Descriptor
<code>tl0_dep_rep_idx</code>	5	u(8)
<code>effective_idr_pic_id</code>	5	u(16)
<code>}</code>		

Proposed semantics

v2 revisions in red



Less than half the size of the SVC SEI message semantics

The temporal level zero index SEI message provides a mechanism for detecting whether a coded picture with TemporalId equal to 0 required for decoding the current access unit is available when NAL unit losses are expected during transport.

tl0_idx indicates the temporal level zero index for the current access unit, if TemporalId is equal to 0. Otherwise (TemporalId is greater than 0), **tl0_idx** indicates the temporal level zero index of the most recent access unit with TemporalId equal to 0 in decoding order.

The following applies:

- If the current access unit contains a NAL unit with RapPicFlag equal to 1, **tl0_idx** shall be equal to 0.
- Otherwise (the current access unit does not contain a NAL unit with RapPicFlag equal to 1), the following is specified:
 1. Let prevTL0AU be the most recent access unit in decoding order that has TemporalId equal to 0.
 2. Let prevTL0AUIIdx be equal to the value of **tl0_idx** that is associated with prevTL0AU.
 3. Depending on TemporalId of the current access unit and **sps_max_temporal_layers_minus1**, the following applies:
 - If TemporalId of the current access unit is equal to 0 **and sps_max_temporal_layers_minus1 greater than 0**, **tl0_idx** shall be equal to $(\text{prevTL0AUIIdx} + 1) \% 65536$.
 - Otherwise, **tl0_idx** shall be equal to prevTL0AUIIdx.

rap_idx indicates RAP index for the current access unit.

Let prevRAP be the most recent access unit in decoding order that has RapPicFlag equal to 1.

Let prevRapIdx be equal to the value **rap_idx** that is associated with prevRAP.

The following applies:

- If the current access unit contains a NAL unit with RapPicFlag equal to 1, **rap_idx shall differ in value from prevRapIdx**.
- Otherwise (the current access unit does not contain a NAL unit RapPicFlag equal to 1), **rap_idx** shall be equal to prevRapIdx.

Conclusion

- **Proposed SEI message improves error resiliency when temporal scalability is used, by enabling decoder to determine missing coded pictures**
- **Base HEVC specification includes temporal scalability**
 - TL0 index SEI message belongs in base specification