

Random access of multiple layers (JCTVC-N0121/JCT3V-E0107)

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Definition of access unit

Definition of access unit:

The access unit is defined with the picture order count instead of output time.

“all *coded pictures* associated **with the same output time**”

-> “all *coded pictures* associated **with the same picture order count**”

- Reason:**
1. Different pictures belonging to different AUs may have the same output time. (e.g. frame-level interleaving with FPA SEI)
 2. Different pictures belonging to the same AU may have different output times. (e.g. time-multiplexing of multiviews)

In Specification text:

access unit: A set of *NAL units* that are associated with each other according to a specified classification rule, are consecutive in *decoding order*, and contain the *VCL NAL units* of all *coded pictures* associated **with the same picture order count** and their associated non-VCL NAL units.

Definition of IRAP access unit

Definition of IRAP access unit:

All coded pictures in an IRAP AU shall be IRAP pictures.

Reason:

1. If a picture with `nuh_layer_id` equal to k in an IRAP AU is not an IRAP picture, the layer with `nuh_layer_id` equal to k cannot be correctly decoded from the IRAP AU.

In Specification text:

intra random access point (IRAP) access unit: *An access unit in which all coded pictures are IRAP pictures.*

Definition of CVS

Definition of coded video sequence (CVS):

The first AU of CVS is an IRAP AU in which the NoRaslOutputFlag values of **all coded pictures are equal to 1**.

Reason:

1. At the starting of a CVS, all RASL pictures associated with IRAP pictures in all layers cannot be correctly decoded.
2. Assuming a DPB is operated is in picture-level, the NoRaslOutputFlag value of each IRAP picture in the first AU of CVS shall be equal to 1.

In Specification text:

coded video sequence (CVS): A sequence of *access units* that consists, in decoding order, of an *IRAP access unit* in which **the NoRaslOutputFlag values of all coded pictures are equal to 1**, followed by zero or more *access units* that are not *IRAP access units* in which **the NoRaslOutputFlag values of all coded pictures are equal to 1**, including all subsequent *access units* up to but not including any subsequent *access unit* that is an *IRAP access unit* in which **the NoRaslOutputFlag values of all coded pictures are equal to 1**.

Definition of IDR and BLA AUs

Definition of IDR and BLA access units:

Keeping the current constraints on IDR and BLA pictures as is;

If a picture in an AU is an IDR picture, all pictures in the AU shall be IDR pictures.

If a picture in an AU is a BLA picture, all pictures in the AU shall be BLA pictures.

The definitions of IDR and BLA access units are proposed

Reason:

Aligning IDR pictures and BLA pictures with an IDR AU and a BLA AU is straightforward and easy to define.

In Specification text:

instantaneous decoding refresh (IDR) access unit: An *access unit* in which **all coded pictures are IDR pictures**

broken link access (BLA) access unit: An *access unit* in which **all coded pictures are BLA pictures.**

Definition of CRA AUs

Definition of TSA/STSA and RADL/RASL access units:

Reason:

Because it is desirable that the GOP and prediction structures of all layers are the same, the alignment of all TSA/STSA and RADL/RASL pictures in an AU has to be same as the alignment of IRAP pictures.

In Specification text:

clean random access (CRA) access unit: An *access unit* in which *all coded pictures are CRA pictures*.

Definition of TSA/STSA & RADL/RASL AUs

Definition of TSA/STSA and RADL/RASL access units:

Reason:

Because it is desirable that the GOP and prediction structures of all layers are the same, the alignment of all TSA/STSA and RADL/RASL pictures in an AU has to be same as the alignment of IRAP pictures.

In Specification text:

step-wise temporal sub-layer access (STSA) access unit: An *access unit* in which all *coded pictures* are *STSA pictures*.

temporal sub-layer access (TSA) access unit: An *access unit* in which all *coded pictures* are *TSA pictures*.

random access decodable leading (RADL) access unit: An *access unit* in which all *coded pictures* are *RADL pictures*.

random access skipped leading (RASL) access unit: An *access unit* in which all *coded pictures* are *RASL pictures*

Definition of long-term reference picture

Definition of long-term reference picture:

Reason:

The interlayer reference pictures are temporally marked as "used for long-term reference".

In Specification text:

long-term reference picture: *A picture* that is marked as "used for long-term reference" *within the same layer.*



Thank you !