Joint Video Experts Team (JVET) of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11
23rd Meeting, by teleconference, 7-16 July 2021

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Title: **On conformance point of high throughput profile**

Status: Input document to JVET

Purpose: Proposal

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Source: KDDI

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Abstract

This contribution proposes an additional conformance point for high throughput conditions in operation-range extensions profile. The current buffer model with hypothetical reference decoder in VVC is well defined for both theoretical and implementation point-of-view. When the VVC is used for mezzanine compression and/or video editing, decoding latency may be unstable due to the CABAC throughput for some implementation. In this contribution, an additional conformance point for the high throughput cases is proposed based on a bit allocation of each frame.

Problem statement

In the current VVC specification, conformance check is realized by the buffer model with hypothetical reference decoder (HRD) [1]. This model is well defined for a typical bitrate range such as secondary distribution and consumer usage. Various picture structures are also well handled such as IBBP, hierarchical B, low-delay, and so on. Required CABAC throughput is also reasonable for hardware implementation. The bin-to-bit ratio is well controlled at the design level. For the ultra-low delay case, the decoding unit is also defined to reduce the codec delay without a large bit bucket. Theoretically speaking, HRD can work independently to the bitrate.

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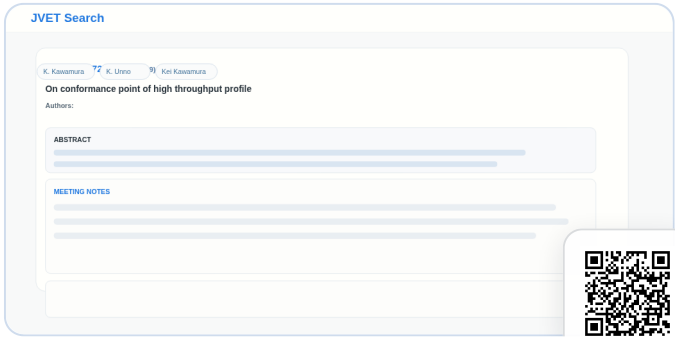
LINKS

CARD

JVET-W0172

http://vexpertise.stbit.ru/documents/JVET-W0172



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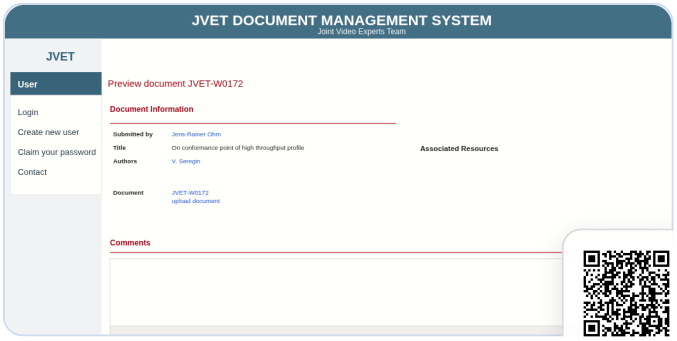

ARCHIVE

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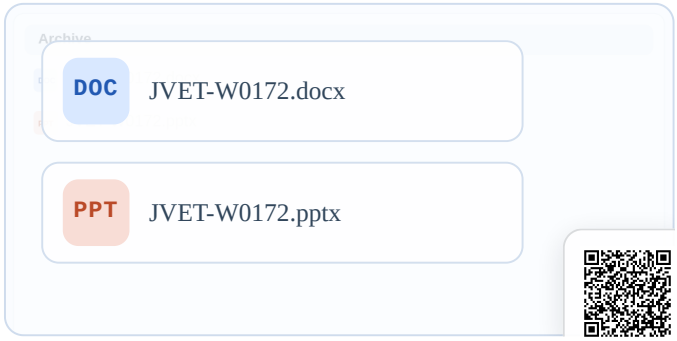
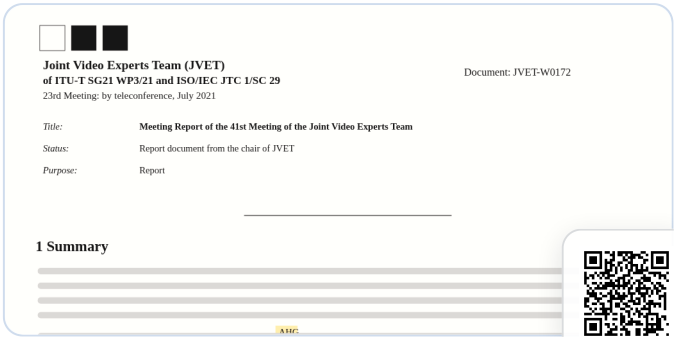


MEETING NOTES

external meeting notes

http://vexpertise.stbit.ru/meeting-notes/source/meeting_23_w



MEETING NOTES

JVET-W0172 On conformance point of high throughput profile [K. Kawamura, K. Unno (KDDI)] [late]

This contribution proposes an additional conformance point for high throughput conditions in operation-range extensions profile. The current buffer model with hypothetical reference decoder in VVC is well defined for both theoretical and implementation point-of-view. When the VVC is used for mezzanine compression and/or video editing, decoding latency may be unstable due to the CABAC throughput for some implementation. In this contribution, an additional conformance point for the high throughput cases is proposed based on a bit allocation of each frame.

It is commented that the motivation needs more clarification. For example, for low latency applications, peak values of throughput would need to be considered rather than a sliding window potentially covering several frames. Which length of N? Could be 5 or 6 frames. Which maximum bit rate? Depends on compression ratio.

Furthermore, delay would be introduced.

It was commented that the proposal basically tries to limit the throughput which turns into a bit rate limitation. This would not work with a high throughput mode.

It was further pointed out that the approach limits the CPB size. Furthermore, it appears that this buffer model would mostly be appropriate for CBR, not VBR

> Currently this was still more at the conceptual level. A text description was announced but not available yet. That would be beneficial for better understanding the details. Further study was encouraged.

AHG11: Neural network-based video coding (20)

General (3)

Contributions in this area were discussed in session 21 at 2200–2300 UTC on Wednesday 14 July 2021 (chaired by JRO).

CITATION

K. Kawamura, K. Unno, "On conformance point of high throughput profile", JVET-W0172, 23rd Meeting: by teleconference, July 2021.