

**Joint Video Experts Team (JVET)
of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC
29/WG 11**

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Title: **A memory issue on adaptive color transform**

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Purpose: Proposal

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Abstract

In this contribution, it is proposed to restrict the large transform such 64-points when an adaptive color transform (ACT) is used. Also, it is introduced that ACT needs large buffering because the inverse-ACT needs three color components after inverse transform. To reduce maximum buffer size, it is proposed that `sps_act_enabled_flag` is implicitly set equal to zero when `sps_max_luma_transform_size_64_flag` is true. The test is carried out and report the impact for coding efficiency. Based on the same test as JVET-P0517, simulation results reportedly show that when the separate-tree partition is off, the average {G, B, R} BD-rate losses {0.3%, 0.1%, 0.2%}, {0.3%, 0.1%, 0.3%} and {xx, xx, xx} for AI, RA and LD configurations, respectively.

Introduction

In the last meeting, ACT was proposed in [1], and it was adopted. As introduced in [1], HEVC already supported ACT tool in the screen content coding (SCC) extension. The contribution proposed to include the ACT tool into VVC.

The block diagram when inverse-ACT at a point of decoder is applied, is shown in Figure 1. The inverse-ACT is located after the inverse transform.

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A memory issue on adaptive color transform

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MEETING NOTES



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Document Information

Submitted by: Jorma Paavola Olli

Title: A memory issue on adaptive color transform

Authors: V. Sengul

Document: JVET-Q0162 updated document

Associated Resources

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ARCHIVE

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MEETING NOTES

external meeting notes

https://www.itu.int/wftp3/av-arch/jvet-site/2020_01_Q_Brussels/JVET-Q_Notes_dI.docx

Joint Video Experts Team (JVET) of ITU-T SG21 WP3/21 and ISO/IEC JTC 1/SC 29 17th Meeting: Brussels, January 2020

Document: JVET-Q0162

Title: Meeting Report of the 41st Meeting of the Joint Video Experts Team

Status: Report document from the chair of JVET

Purpose: Report

1 Summary



MEETING NOTES

[JVET-Q0162](#) A memory issue on adaptive colour transform [K. Kondo, M. Ikeda, T. Suzuki (Sony)]

In this contribution, it is proposed to restrict the large transform such 64-points when an adaptive colour transform (ACT) is used. Also, it is introduced that ACT needs large buffering because the inverse-ACT needs three colour components after inverse transform. To reduce maximum buffer size, it is proposed that **sps_act_enabled_flag** is implicitly set equal to zero when **sps_max_luma_transform_size_64_flag** is true. The test is carried out and report the impact for coding efficiency. Based on the same test as JVET-P0517, simulation results reportedly show that when the separate-tree partition is off, the average {G, B, R} BD-rate losses {0.3%, 0.1%, 0.2%}, {0.4%, 0.1%, 0.3%} and { 0.5%, 0.2%, 0.3%} for AI, RA and LD configurations, respectively.

It is agreed that the issue raised here is valid, and that the loss observed by disabling 64-point transform when ACT is enabled is acceptable (considering the gain that ACT gives for RGB coding). It is pointed out that other solutions could be possible:

- Formulate as bitstream restriction at SPS
- Implicit split to 32x32 when ACT is enabled
- Disable ACT for CU sizes >1024 samples (proponents say they studied this approach, but loss was larger)

Decision: Adopt JVET-Q0162, disable ACT when max transform size is 64 (CTC for 4:4:4 RGB shall use 32 max transform size and ACT).

CITATION

K. Kondo, M. Ikeda, T. Suzuki, "A memory issue on adaptive color transform", JVET-Q0162, 17th Meeting: Brussels, January 2020.

REFERENCES

1. [X. Xiu, Y.-W. Chen, T.-C. Ma, H.-J. Jhu, X. Wang, "Support of adaptive color transform for 444 video coding in VVC", JVET-P0517, 16th Meeting: Geneva, October 2019.](#)