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| *Title:* | **JCT-VC AHG report: SHVC complexity assessment (AHG17)** | | |
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| *Purpose:* | AHG report | | |
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| *Source:* | AhG 17 | | |

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# Abstract

This document reports on the work of the JCT-VC AHG on SHVC complexity assessment (AHG17) between the 15th JCT-VC meeting in Geneva, Switzerland, (22 Oct – 1 Nov. 2013) and 16th JCT-VC meeting in San Jose, US, (9 – 17 Jan. 2014), and lists the related input documents.

# Mandate

**SHVC complexity assessment (AHG17)**

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* Study memory bandwidth, memory usage and computational complexity of scalable tools and methodologies to evaluate them.
* Prepare a report analyzing performance and complexity of single-layer, simulcast, and scalable coding configurations.
* Coordinate with SCE on colour gamut scalability and provide a template to be used for complexity analysis of SHM4.0, single-layer coding, and SCE techniques..

# Activity related to mandates and test results summary

Since no tool-level adoption for SHVC common test conditions were done at 15th JCTVC meeting performance and complexity numbers are un-changed. Table 1 (identical to one published in [1]) summarizes BD-rate performance drop 2 layers scalable system shows compare to HEVC single layer decoder.

Table 1. 2 layers scalable system performance compared to single layer (ctc).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 2x |  |  | 1.5x |  |
| Y | U | V | Y | U | V |
| AI HEVC 2x | | | AI HEVC 1.5x | | |
| 12,8% | 14,9% | 14,6% | 10,5% | 9,8% | 9,3% |
| RA HEVC 2x | | | RA HEVC 1.5x | | |
| 19,0% | 33,1% | 31,8% | 16,2% | 28,9% | 29,2% |
| LD-B HEVC 2x | | | LD-B HEVC 1.5x | | |
| 28,3% | 38,9% | 39,7% | 24,8% | 33,2% | 36,0% |
| LD-P HEVC 2x | | | LD-P HEVC 1.5x | | |
| 26,5% | 37,9% | 38,9% | 22,8% | 32,8% | 35,6% |

# New aspects

The only core experiment on color gamut scalability was performed during inter-meeting period. Complexity assessment module was imported to SCE1 reference s/w, but not used in SCE activity.

Performance of 2 layers scalable system compare to HEVC single layer decoder was analysed in [2] and shown in Table 2.

Table 2. 2 layers scalable system performance compared to single layer (SCE1 content).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **BL 8 bits, EL 10 bits** | | | **BL 10 bits, EL 10 bits** | | |
| **Y** | **U** | **V** | **Y** | **U** | **V** |
| **AI HEVC 2x** | | | **AI HEVC 2x** | | |
| 21,2% | 24,7% | 19,4% | 18,5% | 22,8% | 18,1% |
| **RA HEVC 2x** | | | **RA HEVC 2x** | | |
| 29,2% | 35,2% | 27,8% | 27,5% | 33,7% | 26,9% |

# Recommendations

* Apply complexity analysis to SCE1 tests in order to better understand complexity and performance benefits provided by color gamut scalability tools.

# References

1. [X.Li,](mailto:lxiang@qti.qualcomm.com) [J.Chen,](mailto:cjianle@qti.qualcomm.com) [M.Karczewicz (Qualcomm),](mailto:martak@qti.qualcomm.com) [E.Alshina,](mailto:elena_a.alshina@samsung.com) [A.Alshin (Samsung),](mailto:alexander_b.alshin@samsung.com) [J.Dong,](mailto:jie.dong@interdigital.com) Y.Ye (InterDigital), [E.Francois (Technicolor)](mailto:Edouard.Francois@technicolor.com), “**AhG13: Performance analysis of scalable systems with different down-samplers**,” Document of Joint Collaborative Team on Video Coding, JCTVC-O0071, Oct. 2013
2. [X.Li](mailto:lxiang@qti.qualcomm.com), “**AhG13: Performance analysis of scalable systems with different down-samplers**,” Document of Joint Collaborative Team on Video Coding, JCTVC-P0186, Jan. 2014