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| *Title:* | **JCT-VC AHG report: Screen content extensions software development (AHG 8)** | | |
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# Abstract

This report summarizes the activities of Ad Hoc Group 8 on screen content extension software (SCM) developments that have taken place between the JCT-VC 23rd meeting in San Diego, USA, and the 24th meeting in Geneva, Switzerland.

# Mandates

The ad hoc group was mandated to:

* Coordinate development of the HM SCM software and its distribution.
* Prepare and deliver HM 16.x-SCM-7.0 software version and the reference configuration encodings according to JCTVC-U1015.
* Prepare and deliver additional "dot" version software releases and software branches as appropriate.
* Perform analysis and reconfirmation checks of the behavior of the draft design, and report the results of such analysis.
* Suggest configuration files for additional testing of tools.
* Coordinate with AHG7 to address any identified issues regarding text and software relationship.

# Software revisions

One software revision (HM16.8-SCM7.0) was produced and announced on the JCT-VC email reflector. The integration details and performance summary is provided in the next subsections. The performance results of the software revision was observed to be consistent with the adopted techniques.

## HM-16.8\_SCM-7.0 release

HM-16.8\_SCM-7.0 was announced on the email reflector on March 21st 2015. The software was tagged as <https://hevc.hhi.fraunhofer.de/svn/svn_HEVCSoftware/tags/HM-16.8+SCM-7.0/> .

HM-16.8\_SCM-7.0 incorporates following adoptions/bug fixes:

* JCTVC-W0075: Encoder improvements of PLT in lossless mode.
* JCTVC-W0077: DPB process update for CPR.
* JCTVC-W0078: Bottom up hash calculation
* Software Bug fixes for previous integrations of JCTVC-U0181/JCTVC-V0057
* Ticket #1422: Parsing order mismatch between spec and software.
* Merge to HM 16.8
* General code cleanup and removal of macro’s related to SCM 6.0.

The performance HM-16.8\_SCM-7.0 compared to HM-16.7\_SCM-6.0 was described according to the common test conditions in JCTVC-U1015. No noticeable performance change was observed for the lossy 444 configuration, lossy 420 configuration and lossless 444 configuration.

For the lossless 420 configuration, it is observed that this version provides BD-rate reduction of 1.1%, 0.5% and 0.5% for YUV 1080p & 720p text and graphics category in AI/RA/LB configurations respectively.

Table 1 summarize BD-rate change for lossless 420.

Table 1. BD-Rate change in Lossless 420 configuration (SCM 7.0 Vs SCM 6.0)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **All Intra** | | | |
|  | Bit-rate change (Total) | Bit-rate change (Average) | Bit-rate change (Min) | Bit-rate change (Max) |
|  |
| Text & graphics with motion, 1080p & 720p | -1.1% | -1.0% | -3.2% | 0.0% |
| Mixed content, 1440p & 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| Animation, 720p & 768p | -0.4% | -0.4% | -0.7% | 0.0% |
| Enc Time[%] | 111% | | | |
| Dec Time[%] | 105% | | | |
|  |  |  |  |  |
|  | **Random Access** | | | |
|  | Bit-rate change (Total) | Bit-rate change (Average) | Bit-rate change (Min) | Bit-rate change (Max) |
|  |
| Text & graphics with motion, 1080p & 720p | -0.5% | -0.7% | -1.6% | 0.0% |
| Mixed content, 1440p & 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| Animation, 720p & 768p | 0.0% | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 102% | | | |
| Dec Time[%] | 98% | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  | **Low Delay B** | | | |
|  | Bit-rate change (Total) | Bit-rate change (Average) | Bit-rate change (Min) | Bit-rate change (Max) |
|  |
| Text & graphics with motion, 1080p & 720p | -0.5% | -0.7% | -1.7% | 0.0% |
| Mixed content, 1440p & 1080p | 0.0% | 0.0% | 0.0% | 0.0% |
| Animation, 720p & 768p | 0.0% | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 98% | | | |
| Dec Time[%] | 102% | | | |

## Bug tracker

The JCT-VC issue tracker at <https://hevc.hhi.fraunhofer.de/trac/hevc/> has been updated to allow bug reports to be entered for SCM, currently under milestone HM+SCC-8.0, version SCC-7.0 (HM16.8).

Tickets #1422 was closed during the meeting cycle. Currently there are no open tickets.

# Recommendations

* Continue to develop reference software based on HM16.8\_SCM7.0 and improve its quality.
* Remove macros introduced in previous versions before starting integration towards SCM-6.x/SCM-7.0 such as to make the software more readable.
* Continue merging with later HM versions.