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| **Joint Collaborative Team on Video Coding (JCT-VC)**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  9th Meeting: Geneva, CH, 27 April – 7 May 2012 | Document: JCTVC-I0012 |

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| *Title:* | JCT-VC AHG12 Report: Hooks for scalable coding | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Report | | |
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| *Source:* | Hooks for scalable coding AHG | | |

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# Abstract

This report summarizes the activities of the Hooks for scalable coding investigation Ad Hoc Group between the 8th JCT-VC meeting held in San Jose in Feb 2011 and the current meeting in Geneva.

# Mandates

* Investigate hooks that would be needed for support of bitstream scalability in HEVC syntax.

# Related contributions

The contributions have been classified into categories. There were approximately 20 contributions.

## NAL Unit Header and high layer parameter set related

The contributions in this category are summarized in the attached Excel spreadsheet.

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| [JCTVC-I0132](file:///\\vidyodocs\users\jill\Documents\HEVC\contributions\JCTVC-I0012\current_document.php%3fid=5388) | NAL unit header for scalable extension | [B. Choi](mailto:b.d.choi@samsung.com), [J. Kim](mailto:jhgim@samsung.com), [J. Park (Samsung)](mailto:jeonghoon@samsung.com) |
| [JCTVC-I0217](file:///C:\Users\jill\AppData\Local\Temp\current_document.php%3fid=5475) | Generic HEVC high level syntax for scalability and adaptation | [R. Skupin](mailto:robert.skupin@hhi.fraunhofer.de), [V. George](mailto:valeri.george@hhi.fraunhofer.de), [T. Schierl (HHI)](mailto:thomas.schierl@hhi.fraunhofer.de) |
| [JCTVC-I0230](file:///C:\Users\jill\AppData\Local\Temp\current_document.php%3fid=5488) | Parameter sets modifications for temporal scalability and extension hooks | [J. Boyce](mailto:jill@vidyo.com), [D. Hong](mailto:danny@vidyo.com), [W. Jang (Vidyo)](mailto:wonkap@vidyo.com) |
| [JCTVC-I0251](file:///C:\Users\jill\AppData\Local\Temp\current_document.php%3fid=5509) | On NAL unit header | [T. C. Thang (UoA)](mailto:thang@u-aizu.ac.jp), [J. W. Kang](mailto:jungwon@etri.re.kr), H. Lee, J. S. Choi (ETRI) |
| [JCTVC-I0252](file:///C:\Users\jill\AppData\Local\Temp\current_document.php%3fid=5510) | High-level syntax modifications to support extractor operation | [T. C. Thang (UoA)](mailto:thang@u-aizu.ac.jp), [J. W. Kang](mailto:jungwon@etri.re.kr), H. Lee, J. S. Choi (ETRI) |
| [JCTVC-I0253](file:///C:\Users\jill\AppData\Local\Temp\current_document.php%3fid=5511) | High-level syntax for future scalable extension | [J. W. Kang](mailto:jungwon@etri.re.kr), H. Lee, J. S. Choi (ETRI), T. C. Thang (UoA) |
| [JCTVC-I0262](file:///C:\Users\jill\AppData\Local\Temp\current_document.php%3fid=5520) | Extension of HEVC NAL Unit Syntax Structure | [M. Haque](mailto:munsi.haque@am.sony.com), [A. Tabatabai (Sony)](mailto:ali.tabatabai@am.sony.com) |
| [JCTVC-I0355](file:///C:\Users\jill\AppData\Local\Temp\current_document.php%3fid=5613) | High-level syntax hook for HEVC multi-standard extensions | [Y. -K. Wang](mailto:yekuiw@qualcomm.com), [Y. Chen (Qualcomm)](mailto:cheny@qualcomm.com) |
| [JCTVC-I0524](http://phenix.int-evry.fr/jct/doc_end_user/current_document.php?id=5792)  Late | Hook for scalable extensions: video parameter set | [M. M. Hannuksela](mailto:miska.hannuksela@nokia.com), D. Rusanovskyy (Nokia) |
| [JCTVC-I0535](http://phenix.int-evry.fr/jct/doc_end_user/current_document.php?id=5805)  Late | High-level syntax for 3D and scalable extensions: Inter-layer SPS prediction | T. Rusert |
| [JCTVC-I0536](http://phenix.int-evry.fr/jct/doc_end_user/current_document.php?id=5806)  Late | High-level syntax for 3D and scalable extensions: Signaling of layer identifiers and inter-layer decoding dependencies | T. Rusert |
| [JCTVC-I0570](file:///\\vidyodocs\users\jill\Documents\HEVC\contributions\JCTVC-I0012\current_document.php%3fid=5846)  Late | AHG12: Example 3D-HEVC NAL unit header design | [Y. Chen](mailto:cheny@qualcomm.com), [Y.-K. Wang (Qualcomm)](mailto:yekuiw@qualcomm.com) |
| [JCTVC-I0571](file:///\\vidyodocs\users\jill\Documents\HEVC\contributions\JCTVC-I0012\current_document.php%3fid=5847)  Late | AHG12: Video parameter set and its use in 3D-HEVC | [Y. Chen](mailto:cheny@qualcomm.com), [Y.-K. Wang](mailto:yekuiw@qualcomm.com), [M. Karczewicz (Qualcomm)](mailto:martak@qualcomm.com) |

## VUI and SEI related

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| [JCTVC-I0231](file:///C:\Users\jill\AppData\Local\Temp\current_document.php%3fid=5489) | SEI message for sub-bitstream profile & level indicators | [J. Boyce](mailto:jill@vidyo.com), [D. Hong](mailto:danny@vidyo.com), [W. Jang (Vidyo)](mailto:wonkap@vidyo.com) |
| [JCTVC-I0263](file:///C:\Users\jill\AppData\Local\Temp\current_document.php%3fid=5521) | Extension of HEVC VUI Syntax Structure | [M. Haque](mailto:munsi.haque@am.sony.com), [A. Tabatabai (Sony)](mailto:ali.tabatabai@am.sony.com) |

## Motion vector coding related

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| [JCTVC-I0068](file:///\\vidyodocs\users\jill\Documents\HEVC\contributions\JCTVC-I0012\current_document.php%3fid=5324) | Hook for scalable extensions: conditional presence of motion vector difference | [M. M. Hannuksela](mailto:miska.hannuksela@nokia.com), D. Rusanovskyy, J. Lainema (Nokia) |
| [JCTVC-I0353](file:///C:\Users\jill\AppData\Local\Temp\current_document.php%3fid=5611) | Hooks for temporal motion vector prediction and weighted prediction in HEVC multiview/3DV extension | [Y. Chen](mailto:cheny@qualcomm.com), [Y. -K. Wang](mailto:yekuiw@qualcomm.com), [L. Zhang](mailto:lizhang@qualcomm.com), [V. Seregin](mailto:vseregin@qualcomm.com), [J. Chen (Qualcomm)](mailto:cjianle@qualcomm.com) |
| [JCTVC-I0436](http://wg11.sc29.org/jct/doc_end_user/current_document.php?id=5695) | Modified derivation process on motion vector predictor and weighted prediction for HEVC multi-view extension | [T. Sugio](mailto:sugio.toshiyasu@jp.panasonic.com), T. Nishi (Panasonic) |

## Other

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| [JCTVC-I0235](file:///\\vidyodocs\users\jill\Documents\HEVC\contributions\JCTVC-I0012\current_document.php%3fid=5493) | AHG12: Slice header extension | R. Sjoberg, J. Samuelsson (Ericsson) |

## For information only – in scalable extension scope

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| [JCTVC-I0190](file:///\\vidyodocs\users\jill\Documents\HEVC\contributions\JCTVC-I0012\current_document.php%3fid=5446) | Low Complexity Scalable Extension of HEVC intra pictures based on content statistics | S. Lasserre, F. Le Leannec, E. Nassor (Canon) |

# Recommendations

The Hooks for scalable coding investigation AHG recommends:

* To review all contributions related to hooks that would be needed for support of bitstream scalability in HEVC syntax
* To coordinate with MPEG’s 3DV activity for review of documents in categories:
  + 2.1 NAL Unit Header and high layer parameter set related
  + 2.2 VUI and SEI related
* To coordinate with the High Level Syntax AHG on contributions related to both groups