

# Intel® Stress Bitstreams and Encoder (Intel® SBE) 2017 - HEVC Release Notes (Version 2.3.0)

[Overview](#)

[Features](#)

[Changes History](#)

[System Requirements](#)

[Package Contents](#)

[Installation](#)

[Known Limitations](#)

[Legal Information](#)

[Attributions](#)

## Overview

The **Intel® Stress Bitstreams and Encoder - HEVC** are designed to ensure decoder compliance with HEVC. Streams cover features of **HEVC Main, Main10 and Format Range Extensions profiles High Tier 6.2 level** format and can be used to prove that decoder supports all these features.

## Features

The **Intel® Stress Bitstreams and Encoder - HEVC** Bitstreams includes some sets that are designed for validation of the features related to specific parts of HEVC correspondingly, e.g. INTRA set covers intra specific features and EXTRA set contains streams covering other HEVC format features not directly related to intra or inter prediction.

There are some types of streams such as Syntax, Stress and Smaller. Syntax streams are designed to test certain subsets of features. Stress streams include all the features covered by the bucket. A Smaller stream is similar to a Stress stream of INTER bucket, the major purpose is to test the decoder's ability to handle very small resolutions.

The **Intel® Stress Bitstreams and Encoder - HEVC** Encoder is highly configurable and flexible syntax (HEVC) encoder tool. In opposite to regular encoders it is not intended to achieve compression but only designed to create a valid specification-compliant stream.

Compliant streams contain only allowed combinations of syntax elements and their levels to test decoder for unusual cases or boundary stress cases.

The **Intel® Stress Bitstreams and Encoder – HEVC** Encoder accepts as an input 8-bit *YUV file* and *PAR file* a describing test settings: features to utilize, fixed values, random values. As an output Random Encoder produces encoded bitstream and optionally writes *YUV file* with internal reconstruction data. This file is used to validate that Encoder generated proper compressed file and that resulted bitstream is valid. All bitstreams can be decoded with the reference HEVC HM decoder with all SIMD optimizations disabled.

## Changes History

### Version 2.3.0

- Added long term generation support
- Fixed crashes with some parameters

### Version 2.2.1

- Fixed SKIP mode generation
- Fixed control of loop filter across slices in slice header
- Edited documentation and legal disclaimer

### Version 2.2

- Added Monochrome, Monochrome 12 bit profiles
- Added support of up to 600 slices
- Added new 402, 403 and 404 stress streams for tiles and slices
- Added randomization control for tiles
- Fixed minor bugs

### Version 2.1

- Enable HEVC RExt Main 4:4:4 and 12 bit profiles
- Add new streams with RExt specific technologies
- Enable QP control for wider range
- Update parfiles to match syntax better
- Add broken streams

### Version 2.0

- Major upgrade to support HEVC RExt Main 4:2:2 10 profile
- New RExt stream 501\_main422\_10bit with specific RExt features

### Version 1.7

- Fix all streams to enable minimal possible CU and TU size for maximal CTB size
- Add new stress stream 401\_memaccess
- 3840x2160 and 7680x4320 resolution streams are provided for Level 6.x

### Version 1.6

*Random Encoder improvements:*

- Fix all Inter streams to satisfy spec requirement “The value of NumPicTotalCurr shall be less than or equal to 8”
- Fix all streams SPS values of `log2_diff_max_min_luma_transform_block_size` because maximum TU size could be greater than maximum CU size

- Implement inter-RPS prediction mode, it is now enabled in all Inter streams
- Fix all streams VPS and SPS values of `general_profile_compatibility_flag[i]`, they were set incorrectly.
- Fix all Main10 streams SPS values of `bit_depth_luma_minus8` and `bit_depth_chroma_minus8`, streams could have Main profile and bit depth greater than 8
- Added SPS and PPS range extension to all streams with all RExt features turned off
- Fix problem with parsing parfiles with Linux-style line-endings in Windows environment

#### Version 1.5

- Enable temporal scalability.
- Add new stream `204_temporal`.
- Streams `301_intra_stress` and `302_inter_stress` now have temporal sub-layers.

#### Version 1.4

- Add bitstreams for Main10 Profile.
- IDR frames and SPS headers insert every CVS, see IRAP frequency for every stream in Description table.
- Minimal tile size restriction for Main profile is 256x64. Fix.
- For every IDR frame VPS, SPS and PPS may be completely different from previous CVS which increases number of different high level parameter combinations.
- Implement reference pic list modifications.
- Implement prediction syntax of scaling list.

## System Requirements

### Hardware

- Bitstreams: no limitations.
- Reference Decoder and Random Encoder: IA32, Intel® 64 Architecture processors.

### Software

- Bitstreams: no limitations.
- Reference Decoder: Microsoft\* Windows\* 7, Microsoft Windows 8, Microsoft Windows 8.1, Microsoft Windows Server 2012 or Microsoft Windows Server 2012 R2 for 64-bit architecture, Ubuntu\* 12.04 LTS for 64-bit architecture (currently 12.04.3) or SUSE\* Linux\* Enterprise Server 11 for 64-bit architecture, OS X 10.9 (currently 10.9.3)
- Random Encoder: Microsoft\* Windows\* 7, Microsoft Windows 8, Microsoft Windows 8.1, Microsoft Windows Server 2012 or Microsoft Windows Server 2012, Ubuntu\* 12.04 LTS for 64-bit architecture (currently 12.04.3) or SUSE\* Linux\* Enterprise Server 11 for 64-bit architecture

## Package Contents

Note: <install-folder> - folder where **Intel® Stress Bitstreams and Encoder 2016 - HEVC** is installed.

|  |   |
|--|---|
| <install-folder>\  | Contains <b>Intel® Stress Bitstreams and Encoder 2016 - HEVC</b> Release Notes (this file), End User License Agreement (EULA), spreadsheet with detailed description of every bitstream, history document for each bitstream, Getting started document, Using Branch and Syntax Coverage Static View document, HEVC Syntax Coverage Report and User Guide document. |
| <install-folder>\Branch and Syntax Coverage Static View\ | Contains "Branch and Syntax Coverage Static View" report (basecov.html) for HM reference decoder  |
| <install-folder>\decoder                                 | Contains <b>HEVC HM Decoder (Reference)</b> for Windows*, Linux* and OS X* and readme file.   |
| <install-folder>\streams                                 | Contains compliance <b>HEVC bitstreams</b> , their MD5 check sums and MD5 check sums for decoding results of each encoded file.   |
| <install-folder>\encoder                                 | Contains <b>HEVC Random Encoder</b> for Windows* and Linux*.  |
| <install-folder>\encoder\parfiles                        | Contains parfiles for Intel® Stress Bitstreams and Encoder 2016 - HEVC Encoder.   |

## Installation

- Extract files from archive to the target hard drive.

## Known Limitations

- 32-bit version of decoder may not be able to decode streams of high resolution. It is recommended to use 64-bit decoder for 4K and higher resolution streams.
- Using temporal layer with longterm refereces can cause early bumping of pictures from DPB that results in reconstruction yuv not equal to decoded yuv.

## Legal Information

No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document.

Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

This document contains information on products, services and/or processes in development. All information provided here is subject to change without notice. Contact your Intel representative to obtain the latest forecast, schedule, specifications and roadmaps.

The products and services described may contain defects or errors known as errata which may cause deviations from published specifications. Current characterized errata are available on request.

Copies of documents which have an order number and are referenced in this document may be obtained by calling 1-800-548-4725 or by visiting [www.intel.com/design/literature.htm](http://www.intel.com/design/literature.htm).

HEVC (H.265), MPEG-1, MPEG-2, MPEG-4, H.261, H.263, AVC (H.264), MP3, DV, VC-1, MJPEG, AC3, AAC, G.711, G.722, G.722.1, G.722.2, AMRWB, Extended AMRWB (AMRWB+), G.167, G.168, G.169, G.723.1, G.726, G.728, G.729, G.729.1, GSM AMR, GSM FR are international standards promoted by ISO, IEC, ITU, ETSI, 3GPP and other organizations. Implementations of these standards, or the standard enabled platforms may require licenses from various entities, including Intel Corporation.

Intel, the Intel logo, Intel Core are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

### Optimization Notice

Intel's compilers may or may not optimize to the same degree for non-Intel microprocessors for optimizations that are not unique to Intel microprocessors. These optimizations include SSE2, SSE3, and SSE3 instruction sets and other optimizations. Intel does not guarantee the availability, functionality, or effectiveness of any optimization on microprocessors not manufactured by Intel.

Microprocessor-dependent optimizations in this product are intended for use with Intel microprocessors. Certain optimizations not specific to Intel microarchitecture are reserved for Intel microprocessors. Please refer to the applicable product User and Reference Guides for more information regarding the specific instruction sets covered by this notice.

Notice revision #20110804

## Attributions

### LICENSE: jsonxx

Copyright (c) 2010 Hong Jiang

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

### LICENSE: cpp-argparse

Copyright (C) 2010 Johannes Weis1 <jargon@molb.org>  
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

3. Neither the name of the copyright holder nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

## LICENSE: ITU/ISO/IEC: HM Reference Decoder

Copyright (c) 2010-2014, ITU/ISO/IEC  
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- \* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- \* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- \* Neither the name of the ITU/ISO/IEC nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

## LICENSE: animatescroll.js: jQuery plugin

Copyright (c) 2013 Compzets.com

<http://www.compzets.com>

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

## LICENSE: jquery-visible: jQuery plugin

Copyright (c) 2012 Digital Fusion, <http://teamdf.com/>

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

## LICENSE: JQuery: JavaScript library

Copyright 2005, 2014 jQuery Foundation and other contributors,

<https://jquery.org/>

This software consists of voluntary contributions made by many



individuals. For exact contribution history, see the revision history available at <https://github.com/jquery/jquery>

The following license applies to all parts of this software except as documented below:

====

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software. THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

====

All files located in the node\_modules and external directories are externally maintained libraries used by this software which have their own licenses; we recommend you read them, as their terms may differ from the terms above.