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

(Version 2.3.0)

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 REext 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 **Intel® Stress Bitstreams and Encoder 2016 - HEVC** 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 **HEVC HM Decoder (Reference)** for Windows*, Linux* and OS X* and readme file.
`<install-folder>\streams`	Contains compliance **HEVC bitstreams**, their MD5 check sums and MD5 check sums for decoding results of each encoded file.
`<install-folder>\encoder`	Contains **HEVC Random Encoder** 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.

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