

# Intel® Stress Bitstreams and Encoder 2016 - VP9 Release Notes (Version 2.2)

[Overview](#)

[Features](#)

[Changes History](#)

[System Requirements](#)

[Package Contents](#)

[Installation](#)

[Known Limitations](#)

[Legal Information](#)

[Attributions](#)

## Overview

The **Intel® Stress Bitstreams and Encoder 2016 – VP9** is designed to ensure decoder compliance with VP9\* format. Streams cover all the feature sets and profiles of VP9 format.

## Features

The **Intel® Stress Bitstreams and Encoder 2016 – VP9** offers the following features:

**Stress Bitstreams** for decoder validation. Stress Bitstreams are provided in three main buckets: INTRA, INTER and EXTRA. INTRA and INTER sets are designed for validation of the features related to intra and inter prediction, respectively, while EXTRA set contains streams covering other VP9 format features not directly related to intra or inter prediction.

There are three types of streams: Syntax, Stress and Smaller. Syntax streams are designed to test a certain subset of features. Stress streams include all the features covered by the bucket. A Smaller stream is similar to a Stress stream of INTER bucket, its major purpose is to test the decoder's ability to handle very small resolutions. The only exception for Syntax streams is the stream dedicated to tile testing, which in addition has 16384×240 version to test vertical tiles of maximum width.

**Random Encoder**, a highly configurable and flexible syntax (VP9) encoder tool. Unlike 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.

As an input, Random Encoder accepts a *YUV file* and a *PAR file* describing test settings: features to utilize, fixed values, random values. As an output, Random Encoder produces encoded bitstream and optionally writes a *YUV file* with internal reconstruction data. This file is used to validate that Random Encoder generated a proper compressed file and that the resulting bitstream is valid.

**Error Resilience Encoder**, a tool based on Random Encoder intended to generate non-compliant streams for decoder error resilience testing.

The package also includes the **libvpx reference decoder**, with all SIMD optimizations disabled. This decoder is used to test all the provided bitstreams.

## Changes History

### Version 2.2

*Random Encoder improvements:*

- Add option to control the distribution of transform coefficients by tokens
- Fix end-of-block distribution in randomized transform mode
- Add option to disable zero-height tile generation

*Parfiles and streams:*

- Update Smoke Test Streams set: improved coverage with 2x lesser memory footprint
- Add new streams to reach 100% context coverage
- Add new broken streams for Profile 0 and Profile 2

### Version 2.1

*Random Encoder improvements:*

- Add ability to iterate parameters (Start, Step, End) for most of the parameters

*Parfiles and streams:*

- Add new Smoke Test Streams and parfiles for Profile 0 and Profile 2 (small set of streams for fast smoke testing)
- Add new broken streams for Profile 0 and Profile 2

### Version 2.0

- Add Visual Packs for Profile 0 and Profile 2
- Add Broken Packs for Profile 0 and Profile 2
- Add `feature_info` utility (counts occurrences of certain values of each syntax element and then dumps this statistics to a .csv file)

*Random Encoder improvements:*

- Add ability to override distributions for specified frames
- Improve transform coefficients randomization
- Add option to explicitly specify refresh mask
- Add option to set frame size in pixels
- Add ability to separately set sign bias for last, golden and altref frames
- Fix issue when intra-only frame with zero refresh mask and partially enabled scaling caused encoder to crash
- Fix uninitialized distributions in residual randomization

- Fix default distribution values
- Parfiles and streams:*
- Add new parfiles to showcase overriding distributions
  - Changed streams with transform coefficients randomization

### Version 1.7

*Random Encoder improvements:*

- Fix small chance of inter frames with no valid references
- Fix vertical tile parameter handling when requested values are outside of range allowed by frame resolution

*Parfile (streams) changes:*

- Three new parfiles: for testing the worst performance cases
- New visually clean parfiles: for generation of bitstreams with no visual artifacts

### Version 1.6

*Random Encoder improvements:*

- New option "min\_frame\_size" in parfile to limit minimum frame size for streams with variable resolution
- Fix problem with parsing parfiles with Linux\* line endings in Windows\* environment

*Parfile (streams) changes:*

- Three new parfiles with the same settings as 204th, 205th and 250th, but with additional minimum frame restriction of 64x64

### Version 1.5

*Random Encoder improvements:*

- Support intra-only as the first frame in bitstream
- Don't allow randomized residual to yield inverse transform overflow
- Support bit-depth and chroma-sampling change at intra-only frames (previously at key frames only)
- Allow one or two reference frames in header to have invalid resolution (out of 1/16..2x range)
- Special command-line option for memory-bandwidth configuration, increasing number of memory reads by 12%
- Special option for visually clean streams allowing to repeat invisible frames with show\_existing\_frame flag

*Parfile (streams) changes:*

- Two new parfiles: one for testing start with intra-only frame and another one is 250\_extra\_stress with disabled frame scaling
- New parameter "start\_w\_intra\_only" defining the chances that stream will begin with intra-only frame instead of key one
- New parameter "mv\_joint\_zero" helping to reach more uniform coverage of MV\_JOINT\_TYPE element
- Change distribution of "error\_resilient" parameter to provide better chances for taking motion-vector candidates from the previous frame
- Change distribution of randomized residual to full span (invalid results of randomization are discarded by default)

### Version 1.4

- Add Profile 1 and Profile 3 support (4:2:2, 4:4:0 and 4:4:4 and mixed)

### Version 1.3

- Add new Memory-bandwidth stress bitstreams, which are targeted to maximize the amount of reads of reference frame surfaces.

- Introduce changes from libvpx:
  - libvpx g899585e: reference frame size restrictions
  - libvpx g29071a4: invalid memory access on 2x downscale
  - libvpx gbefc36d: invalid memory access in convolve() function
  - libvpx gd237d48: condition for border extension
- Don't force block with zero coefficients to skip flag at SB level.
- In transform randomization mode, allow to fill the rest of block with zero coefficients instead of putting an EOB token.
- Allow empty horizontal tiles at small resolution.
- Change default range for random residual from (-255..255) to (-127..127) to avoid overflows in inverse transform
- Change offset in color bit-depth up-conversion according to changes in behavior of --output-bit-depth option in libvpx decoder
- Fix:
  - random residual not being used for intra blocks;
  - avoid unnecessary MV clamping;
  - "frame\_context\_idx" setting not being read from parfile;
- Add new options to Random Encoder:
  - extreme\_residual=BOOL (use only extreme values for random residual);
  - idct\_overflow\_hw=BOOL (enable Emulate-Hardware-Highbitdepth behavior for iDCT calculation);
- Add new report: Branch and Syntax Static View
- Update MD5 check sum for Plum\_VP9\_432x240\_301\_idct\_rounding.vp9 stream (see Known Limitations section)

## Version 1.2

- Added High Bit Depth (HBD) support for Profile 2 (10 and 12 bits 4:2:0)

## Version 1.1

- New approach to frame resolution randomization to satisfy new restriction on reference frame size introduced by commit g9f37d14 in libvpx repository.
- Previously it was allowed to pick any references as last, golden and alt-ref frame, if they are not used for actual inter prediction. Now decoder checks ref-frame size prior to superblock decoding, so encoder have to pick frame resolution giving at least one valid reference in existing ref-frame pool. Parfile settings for frame size randomization also changed.
- Change of probability model used for intra-only frame handing according to commit 7c43fb6 in libvpx repo. This commit makes reference decoder incompatible with older bitstreams containing intra-only frames and vice versa, new bitstreams are incompatible with old decoders.
- All bitstreams utilizing frame scaling or intra-only frames have changed

## System Requirements

### Hardware

- Bitstreams: no limitations.
- Reference Decoder: systems based on IA-32 architecture or Intel® 64 architecture.

### 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 – VP9** is installed.

|  |  |
|--|--|
| <install-folder>\  | Contains <b>Intel® Stress Bitstreams and Encoder 2016 - VP9</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 libvpx decoder   |
| <install-folder>\decoder                                 | Contains <b>VP9 Decoder (Reference)</b> for Windows*, Linux* and OS X* and readme file.  |
| <install-folder>\streams                                 | Contains compliance <b>VP9 bitstreams</b> , their MD5 check sums and MD5 check sums for decoding results of each encoded file.   |

|  |  |
|--|--|
| <code>&lt;install-folder&gt;\encoder</code>          | Contains <b>VP9 Random Encoder</b> for Windows* and Linux*.                    |
| <code>&lt;install-folder&gt;\encoder\parfiles</code> | Contains parfiles for Intel® Stress Bitstreams and Encoder 2016 – VP9 Encoder. |

## Installation

- Extract files from archive to the target hard drive.

## Known Limitations

- Due to different definitions of `tran_low_t` in default and high-bit-depth configurations (`int16_t` vs `int32_t`), these configurations produce different results for the 301st stream. We calculated md5 sums using decoder with high-bit-depth option enabled. For the 301st stream we put into package additional md5 file named `Plum_VP9_432x240_301_idct_rounding_1.1_dec_hbd_disabled.md5`, so you can verify against configuration without high-bit-depth support.

## 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).

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 Weiszl <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: libvpx: VP8/VP9 Codec SDK

Copyright (c) 2010, The WebM Project authors. 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 Google, nor the WebM Project, 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.

#### LICENSE: Beautiful Soup 4

Copyright (c) 2004-2015 Leonard Richardson

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.

Beautiful Soup incorporates code from the `html5lib` library, which is also made available under the MIT license. Copyright (c) 2006-2013 James Graham and other contributors

## LICENSE: Jinja2

Copyright (c) 2009 by the Jinja Team, see AUTHORS for more details.

Some 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.
- \* The names of the contributors may not 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 OWNER 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: path.py

Copyright (c) 2010 Mikhail Gusarov

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: python-progressbar

progressbar - Text progress bar library for python  
Copyright (c) 2008 Nilton Volpato

All rights reserved.

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

- a. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- b. 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.
- c. Neither the name of the author 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 REGENTS 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: Pygments

Copyright (c) 2006-2015 by the respective authors (see AUTHORS file).  
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.

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 OWNER 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: PyYAML

Copyright (c) 2006 Kirill Simonov

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: sarge

Copyright (c) 2012-2014 by Vinay Sajip.  
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.
- \* The name(s) of the copyright holder(s) may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDER(S) "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(S) 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: PyInstaller

The Intel® Stress Bitstreams and Encoder Tools binaries created with PyInstaller so they include bootloader and related files from PyInstaller covered with Bootloader Exception listed below:

```
=====
The PyInstaller licensing terms
=====
```

Copyright (c) 2010-2013, PyInstaller Development Team

Copyright (c) 2005-2009, Giovanni Bajo

Based on previous work under copyright (c) 2002 McMillan Enterprises, Inc.

PyInstaller is licensed under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

### Bootloader Exception

-----

In addition to the permissions in the GNU General Public License, the authors give you unlimited permission to link or embed compiled bootloader and related files into combinations with other programs, and to distribute those combinations without any restriction coming from the use of those files. (The General Public License restrictions do apply in other respects;

for example, they cover modification of the files, and distribution when not linked into a combine executable.)

#### Bootloader and Related Files

-----

Bootloader and related files are files which are embedded within the final executable. This includes files in directories:

./bootloader/

./PyInstaller/loader