Intel® Integrated Performance Primitives (Intel® IPP) 2018 Update 3.1 Release Notes

22 May, 2018

Contents

Overview

This document provides a general summary of new features and important notes about the Intel® Integrated Performance Primitives (Intel® IPP) library software product.

Please see the following resources available online for the latest information regarding the Intel® Integrated Performance Primitives (Intel® IPP):

- [Intel® IPP Main Product Page](#)
- [Intel® IPP Installation Guide](#)
- [Intel® IPP 2018 System Requirements](#)

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What's New in Intel® IPP 2018 Update 3.1

- Minor improvements in mitigation for security vulnerability [CVE-2018-3617](#) (http://cve.mitre.org/cgi-bin/cvename.cgi?name=2018-3617) in the Intel® IPP Cryptography libraries.

  Note: Intel® IPP 2018 Update 3.1 provides an update package for the Cryptography functions, and does not include Intel® IPP main package. This Cryptography release can work with Intel® IPP 2018 Update 3 main packages.

What's New in Intel® IPP 2018 Update 3

- Improved LZ4 compression and decompression performance on data with high entropy.

- Fixed a number of internal and external defects. Visit [the Intel® IPP 2018 bug fixes](#) for more information.

What's New in Intel® IPP 2018 Update 2.1

- Mitigated security vulnerability [CVE-2018-3617](#) (http://cve.mitre.org/cgi-bin/cvename.cgi?name=2018-3617) in the Intel® IPP Cryptography libraries.

Note: Intel® IPP 2018 Update 2.1 provides an update package for the Cryptography functions, and does not include Intel® IPP main package. This Cryptography release can work with Intel® IPP 2018 Update 2 main packages.

What's New in Intel® IPP 2018 Update 2

- Added the new APIs to computes the CRC24 and CRC16 checksum. The APIs support CRC24A, CRC24B, CRC24C and CRC16 polynomial functions, and are included in the Intel® IPP embedded domain within the Intel® System Studio package.

- Added new APIs in the image processing domain for fixed point Resize functionality. The functionality provides faster resize operations with less accuracy.

- Extended optimization for Intel®AVX2 and Intel® AVX-512 instruction set in the following functions:
    - Image processing: ippiSeparableFilter, ippiNorm, ipprFilterBorder_L
    - Signal processing: ippsAdd_32u

- Extended optimization for Intel® SSE4.2 and Intel®AVX2 instruction set for LZ4 data compression functions.

- Fixed the problem on the incorrect code dispatching for the Intel® AVX512 processor systems running with the OS that does not support AVX-512 instructions. The problem caused some Intel® IPP functions report "illegal instructions" errors.

- Fixed a number of internal and external defects. For more details, please, visit Intel® IPP 2018 Bug Fixes.

What's New in Intel® IPP 2018 Update 1

- Added new Platform-Aware APIs ipprFilterBorder for 3D data filtering, and ipprCopyBorder for 3D border data copying.

- Extended optimization for Intel® AVX-512 instruction set in the following functions:
    - Image processing: ippiFilterBorder_<16u|16s>_C1R; ippiResizeAntialiasing_8u_C4; ippiResizeLanczos_8u
    - Signal processing: ippsSqrt_<8u|16s|16u|16sc|32s>;ippsCopyBE_1u;
    - FFT transform functions for order size larger than 17.

- Extended optimization for Intel® SSE4.2 instruction set in the following functions:
    - Image processing: ippiFilterBoxBorder_<16s|8u>; ippiFilterBoxBorder_<16s|8u>_C3, ippiResizeLenear for scale size 0.5, ippiMean_StdDev
    - Signal processing: ippsMagnitude_<64f|32f>

- Fixed a number of internal and external defects. Visit the [Intel® IPP 2018 bug fixes](#) for more information.

What's New in Intel® IPP 2018

- Added new functions to support the LZ4 data compression and decompression. This release also introduces the patch files for LZ4 source to provide drop-in optimization with the Intel® IPP functions.

- Introduced the standalone cryptography packages. The cryptography functions no longer depend on the main Intel® IPP packages, and can be used without the main Intel® IPP packages.

- Introduced the optimization code for the GraphicsMagick source. The code can provide drop-in optimization on GraphicsMagick with the Intel® IPP functions:

  - The code supports GraphicsMagick version 1.3.25, and provides optimization for the following GraphicsMagick APIs: ResizeImage, ScaleImage, GaussianBlurImage, FlipImage, and FlopImage.

  - The optimization code can improve the APIs performance by up to 4x, depending on the functionality, input parameters, and processors.

- Made the Integration Wrappers APIs part of the Intel® IPP packages.

- Computer Vision:

  - Added the 64-bit data length support to Canny edge detection functions (ippiCanny_32f8u_C1R_L).

- Color Conversion:

  - Added the ippiDemosaicVNG functions that support the demosaicing algorithm with VNG interpolation.

- Cryptography:

  - Added the Elliptic Curves key generation and Elliptic Curves based Diffie-Hellman shared secret functionality.

  - Added the Elliptic Curves sign generation and verification functionalities for the DSA, NR, and SM2 algorithms.

- Added CBC-CTS mode encryption and decryption to AES and SMS4 block ciphers.

- Performance:

  - Extended optimization for the Intel® Advanced Vector Extensions 512 (Intel® AVX-512) and Intel® Advanced Vector Extensions 2 (Intel® AVX2) instruction sets.

  - Improved performance of LZO data compression functions on Intel® AVX2 and Intel® Streaming SIMD Extensions 4.2 (Intel® SSE4.2).

- Other Changes:

  - Removed support for Intel® Pentium® III processor. The minimal supported instruction set is Intel® Streaming SIMD Extensions 2 (Intel® SSE2).

  - Removed support for the Intel® Xeon Phi™ x100 product family coprocessor (formerly code name Knights Corner) in this release.
    - The Intel® Xeon Phi™ x100 product family coprocessor (formerly code named Knights Corner) was officially announced end of life in January 2017. As part of the end of life process, the support for this family will only be available in the Intel® Parallel Studio XE 2017 version. Intel® Parallel Studio XE 2017 will be supported for a period of 3 years ending in January 2020 for the Intel® Xeon Phi™ x100 product family. Support will be provided for those customers with active support.

Threading Notes

To support the internal threading in the Intel® IPP functions, Intel® IPP provides the Threading Layer APIs in the platform-aware functions. These APIs can support both 64-bit object sizes (for large size images and signal data) and internal threading in Intel® IPP functions. Check the "Threading Layer Functions" pat in the Intel® IPP Developer Reference to get more information on these APIs. Your feedback on extending the new threading functions is welcome.

The legacy Intel IPP threaded libraries are available by the custom installation, and the code written with these libraries will still work as before. However, the threaded library will not expand its threading functions, and the new threading will be developed only in the new Intel® IPP threading layer APIs. User's application is recommended to use the new Intel® IPP threading layer APIs or implement the external threading in their applications.

Known Intel® IPP 2018 Update 3.1 Issues and Limitations

- Intel® IPP 2018 Update 3.1 provides an update package for the Cryptography functions and does not include Intel® IPP main package. This Cryptography release can work with Intel® IPP 2018 Update 3 main packages.

System Requirements

For information about the Intel® IPP system requirements, please visit Intel® Integrated Performance Primitives (Intel® IPP) 2018 System Requirements page.

Intel® IPP 2018 Documentation

Starting with this version of Intel IPP, most of the documentation is only available online at Intel® Software Documentation Library. You can also download it from the Intel® Software Development Products Registration Center > Product List > Intel® Parallel Studio XE(or Intel® System Studio) Documentation.

Product Contents

The Intel® IPP for Windows*, Linux* OS, and macOS* is provided as part of the Intel® Parallel Studio XE and Intel® System Studio product. It is also available from the free Intel® performance libraries program:

- Installation package only supports 64-bit host system. It includes both the 64-bit and 32-bit target libraries.
- Installation package also provides the online installer that downloads materials chosen during installation

Intel® IPP Cryptography is provided as the following optional packages:

- Intel® IPP Cryptography for Windows*
- Intel® IPP Cryptography for Linux* OS
- Intel® IPP Cryptography for macOS*

Intel® IPP Cryptography

Intel® IPP Cryptography is a separate installation package that contains the binaries and header files needed to utilize the functions contained in the Intel IPP cryptography domain. Intel® IPP 2018 removed the cryptography code dependency on the main package, and the cryptography functions are provided as the standalone packages. To obtain the Intel IPP Cryptography libraries, please review the knowledge base article: where do I download the Intel® IPP cryptography libraries.

Technical Support

If you did not register your Intel® software product during installation, please do so now at the Intel® Software Development Products Registration Center. Registration entitles you to free technical support, product updates and upgrades for the duration of the support term.

For technical information about the Intel® IPP, including FAQ's, tips and tricks, and other support information, please visit the Intel® IPP forum: http://software.intel.com/en-us/forums/intel-integrated-performance-primitives/ and browse the Intel® IPP support page: https://software.intel.com/en-us/intel-ipp-support/.

For general information about Intel technical support, product updates, user forums, FAQs, tips and tricks and other support questions, please visit http://www.intel.com/software/products/support/.

Note: If your distributor provides technical support for this product, please contact them rather than Intel.

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- zlib library:

  zlib.h -- interface of the 'zlib' general purpose compression library version 1.2.8, April 28th, 2013
  Copyright© 1995-2013 Jean-loup Gailly and Mark Adler
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- bzip2:

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