

# Intel® System Studio 2016 Update 3 for Windows\* Installation Guide and Release Notes

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Installation Guide and Release Notes for Windows\* Host and Windows\* target

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# 1 Introduction

This document provides a brief overview of the Intel® System Studio 2016 for Windows\* and provides pointers to where you can find additional product information, technical support, articles and whitepapers.

It also explains how to install the Intel® System Studio product. Installation is a multi-step process and may contain components for the development host and the development target. Please read this document in its entirety before beginning and follow the steps in sequence.

The Intel® System Studio 2016 for Windows\* consists of multiple components for developing, tuning and deploying system and application code targeted towards embedded, Intelligent Systems, Internet of Things and mobile designs.

It is intended for use on Microsoft\* Windows\* host operating systems with the intention of deploying build results and doing sampling analysis on Microsoft\* Windows\* and Microsoft\* Windows\* Embedded target.

The tool suite is targeting development for embedded intelligent system platforms ranging from Intel® Atom™ Processor based low-power embedded platforms to 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> generation Intel® Core™ microarchitecture based designs. Please refer to the Intel® System Studio User's Guide for guidance on how to apply Intel® System Studio to the various use case scenarios that are available with this versatile product.

Due to the nature of this comprehensive integrated software development tools solution, different Intel® System Studio components may be covered by different licenses. Please see the licenses included in the distribution as well as the [Disclaimer and Legal Information](#) section of these release notes for details.

## 2 What's New

This section highlights important changes in the actual product release.

More detailed information about new features and changes in the respective product release notes (s. also section '6.1 Release Notes and User Guide Location')

### Intel® System Studio 2016 Update 3 for Windows\*

#### 1. Intel® C++ Compiler:

- Annotated source listing
  - This feature annotates source files with compiler optimization reports. The listing format may be specified as either text or html.
- New attribute, pragma, and compiler options for code alignment
- Additional C++14 features supported
- Additional C11 features supported
- New and Changed Compiler Options

View the full release notes for more details.

#### 2. Intel® Math Kernel Library (Intel® MKL):

- Introducing Deep Neural Networks (DNN) primitives including convolution, normalization, activation and pooling functions intended to accelerate convolutional neural networks (CNNs) and Deep neural networks (DNNs) on Intel® Architecture
- The SP2DP interface library is removed
- Removed pre-compiled BLACS library for MPICH v1; MPICH users can still build the BLACS library with MPICH support via Intel [MKL MPI wrappers](#)
- Sparse BLAS:
  - Improved performance of parallel BSRMV functionality for processor supporting Intel® Advanced Vector Extensions 2 (Intel® AVX2) instruction set
- Intel MKL PARDISO:
  - Added support for mkl\_progress in Parallel Direct Sparse Solver for Clusters
- DFT:
  - Improved performance of batched 1D FFT with large batch size on processor supporting Intel® Advanced Vector Extensions (Intel® AVX), Intel AVX2, Intel® Advanced Vector Extensions 512 (Intel® AVX512) and IntelAVX512\_MIC instruction sets
- Data Fitting:
  - Introduced 2 new storage formats for interpolation results (DF\_MATRIX\_STORAGE\_SITES\_FUNCS\_DERS, DF\_MATRIX\_STORAGE\_SITES\_DERS\_FUNCS)

#### 3. Intel® Performance Primitives (Intel® IPP):

- Added new APIs (Intel® IPP 64x functions) to support 64-bit data length in the image and signal processing domains:
  - This release provides the 64x functions for memory allocation, image addition, subtraction, multiplication, division, resizing, and filtering operations.
  - The Intel® IPP 64x functions are implemented as wrappers over Intel® IPP functions operating on 32-bit sizes by using tiling and multithreading. The 64x APIs support

external threading for Intel® IPP functions, and are provided in the form of source and pre-built binaries.

- Added integration wrappers for some image processing and computer vision functions. The wrappers provide the easy-to-use C and C++ APIs for Intel® IPP functions, and they are available as a separate download in the form of source and pre-built binaries.
- Performance and Optimization:
  - Extended optimization for Intel® Advanced Vector Extensions 512 (Intel® AVX-512) instruction set on Intel® Many Integrated Core Architectures (Intel® MIC Architectures). Please see the Intel® IPP Functions Optimized for Intel® AVX-512 article for more information.
  - Extended optimization for Intel® AVX-512 instruction set on Intel® Xeon® processors.
  - Extended optimization for Intel® Advanced Vector Extensions 2 (Intel® AVX2) instruction set on the 6th Generation Intel® Core™ processors. Please see the Intel® IPP Functions Optimized for Intel® AVX2 article for more information.
  - Extended optimization for Intel® Streaming SIMD Extensions 4.2 (Intel® SSE4.2) instruction set on Intel® Atom™ processors.
- Signal Processing:
  - Added the ippsIIR functions that perform zero-phase digital IIR filtering.
  - Added 64-bit data length support to the ippsSortRadixAscend functions.
- Image Processing:
  - Added the ippiScaleC functions to support image data scaling and shifting for different data types.
- Data Compression:
  - Added the patch files for the zlib compression and decompression functions. The patches provide drop-in optimization with Intel® IPP functions, and support zlib version 1.2.5.3, 1.2.6.1, 1.2.7.3 and 1.2.8.
- Removed the tutorial from the installation package, and its sample code and documentation are now provided online (<https://software.intel.com/en-us/product-code-samples>).
  - Threading Notes: Though Intel® IPP threaded libraries are not installed by default, these threaded libraries are available by the custom installation, so the code written with these libraries will still work as before. However, the multi-threaded libraries are deprecated and moving to external threading is recommended. Your feedback on this is welcome

#### 4. Intel® Threading Building Blocks:

- Removed a few cases of excessive user data copying in the flow graph.
  - Improved robustness of `concurrent_bounded_queue::abort()` in case of simultaneous push and pop operations.
  - Modified `parallel_sort` to not require a default constructor for values and to use `iter_swap()` for value swapping.
  - Added support for creating or initializing a `task_arena` instance that is connected to the arena currently used by the thread.
- Preview Features:**
- Added template class `opencl_node` to the flow graph API. It allows a flow graph to offload computations to OpenCL\* devices.

- Extended `join_node` to use type-specified message keys. It simplifies the API of the node by obtaining message keys via functions associated with the message type (instead of node ports).
- Added `static_partitioner` that minimizes overhead of `parallel_for` and `parallel_reduce` for well-balanced workloads.
- Improved template class `async_node` in the flow graph API to support user settable concurrency limits.
- Class `global_control` supports the value of 1 for `max_allowed_parallelism`.
- Added `tbb::flow::async_msg`, a special message type to support communications between the flow graph and external asynchronous activities.
- `async_node` modified to support use with C++03 compilers

**Bugs fixed:**

- Fixed a bug in dynamic memory allocation replacement for Windows\* OS.
- Fixed excessive memory consumption on Linux\* OS caused by enabling zero-copy realloc.

## 5. Intel® System Debugger:

- Support for Eclipse\* 4.5 (Mars.2) for the trace viewer. The package is also included in the Intel® System Studio installation package for optional installation.
- Support for debug format Dwarf4
- SMM support for Intel® Core™ based processors debugging.
- A new EFI script and three buttons are added for loading PEI/DXE modules easily in System Debug

## 6. Intel® VTune™ Amplifier for Systems

- Support for the next generation **Intel® Xeon® Processor E5 v4 Family** (formerly codenamed "Broadwell-EP")
- Detection of the **OpenCL™ 2.0 Shared Virtual Memory** (SVM) usage types per kernel instance
- **Driverless** event-based sampling collection for uncore events enabled for the Memory Access analysis.
- Support for the **Microsoft\* Visual Studio 2015 Update 2**

**Preview features:**

- **Disk Input and Output** analysis that monitors utilization of the disk subsystem, CPU and processor buses, helps identify long latency of I/O requests and imbalance between I/O and compute operations
- **GPU Hotspots** analysis targeted for GPU-bound applications and providing options to analyze execution of OpenCL™ kernels and Intel Media SDK tasks
- Basic Hotspots analysis extended to **support Python\* applications** running via the Launch Application or Attach to Process modes.

**Intel® Energy Profiler for Windows:**

- Update to version v1.14.1
- Extended collection start time information to include microseconds to better enable correlation with event trace logs.
- Corrected reporting of Gfx P-states on Intel® 6<sup>th</sup> Generation Core™ (formerly code-named "Skylake") platform.

## 7. Intel® Inspector

- No update vs. Update 2

## 8. Intel® Graphics Performance Analyzers (Intel® GPA)

- **New Features for Analyzing Microsoft DirectX\* Applications**

Intel GPA now provides alpha-level support for DirectX\* 12 application profiling. This version has limited profiling and debug capabilities and might work unstable on some workloads. You can find more details regarding the supported features below.

- Graphics Frame Analyzer provides detailed GPU hardware metrics for Intel® graphics. For third-party GPUs, GPU Duration and graphics pipeline statistics metrics are available.
- DirectX states, Geometry, Shader code, Static and dynamic textures, Render targets resources are available for frame-based analysis in Graphics Frame Analyzer.
- Simple Pixel Shader, Disable Erg(s) performance experiments, Highlighting and Disable draw calls visual experiments are available in Graphics Frame Analyzer
- Time-based GPU metrics for Intel graphics, CPU metrics, Media and Power metrics in System Analyzer.
- System Analyzer HUD includes support for hotkeys, the same set of metrics as in System Analyzer, messages and settings.

**Note:** In order to capture DirectX 12 application frames, enable the **Force DirectX12 injection** option in the Graphics Monitor **Preferences** dialog box.

**Note:** System memory consumption is expected to be high in this release at both time of capture and during playback. Needed memory is related to workload and frame complexity and varies greatly. 8GB is minimum, 16GB is recommended, with some workloads requiring more.

- **New Features for Analyzing OpenGL/OpenGL ES\* Applications**

- Enabled support for GPU hardware metrics in System Analyzer and Graphics Frame Analyzer on the 6th Generation Intel® Core™ Processors for Ubuntu\* targets.
- Several OpenGL API calls (e.g. glTexImage2D, glReadPixels, glCopyTexImage2D, etc.) are now represented as ergs in Graphics Frame Analyzer, which allows measuring GPU metrics for them and see the used input and output.
- Resource History was implemented in Graphics Frame Analyzer. When you select a particular texture or program in the Resource viewer, colored markers appear in the bar chart, indicating the ergs where these resources are used. The color of these markers corresponds to the type of the resource: input, execution, or output.

View the full [release notes](#) for more details

### 2.1 Versions History

This section highlights important changes in previous Intel® System Studio 2016 product versions.

## Intel® System Studio 2016 Update 2 for Windows\*

### 1. Intel® C++ Compiler:

- Support for Microsoft Visual Studio\* 2015 Update 1
  - The Short Vector Random Number Generator (SVRNG) library provides intrinsics for the IA-32 and Intel® 64 architectures running on supported operating

systems. The SVRNG library partially covers both standard C++ and the random number generation functionality of the Intel® Math Kernel Library (Intel® MKL). Complete documentation may be found in the Intel® C++ Compiler 16.0 User and Reference Guide.

- Intel® SIMD Data Layout Templates (Intel® SDLT)
  - Intel® SDLT is a library that helps you leverage SIMD hardware and compilers without having to be a SIMD vectorization expert.
  - Intel® SDLT can be used with any compiler supporting ISO C++11, Intel® Cilk™ Plus SIMD extensions, and `#pragma ivdep`
  - Intel® SIMD Data Layout Templates:
- New C++14 and C11 features supported
- And many others ... For a full list of new features please refer to the Composer Edition product release notes

## 2. Intel® Math Kernel Library (Intel® MKL)

- Introduced `mkl_finalize` function to facilitate usage models when Intel MKL dynamic libraries or third party dynamic libraries are linked with Intel MKL statically are loaded and unloaded explicitly
- Introduced sorting algorithm
- Performance improvements for BLAS, LAPACK, ScaLAPACK, Sparse BLAS
- Several new features for Intel MKL PARDISO
- Added Intel® Threading Building Blocks threading support for all and OpenMP\* for some BLAS level-1 functions.

## 3. Intel® Performance Primitives (Intel® IPP)

- Image Processing:
  - Added the contiguous volume format (C1V) support to the following 3D data processing functions: `ippiWarpAffine`, `ippiRemap`, and `ippiFilter`.
  - Added the `ippiFilterBorderSetMode` function to support high accuracy rounding mode in `ippiFilterBorder`.
  - Added the `ippiCopyMirrorBorder` function for copying the image values by adding the mirror border pixels.
  - Added mirror border support to the following filtering functions: `ippiFilterBilateral`, `ippiFilterBoxBorder`, `ippiFilterBorder`, `ippiFilterSobel`, and `ippiFilterScharr`.
  - Kernel coefficients in the `ippiFilterBorder` image filtering functions are used in direct order, which is different from the `ippiFilter` functions in the previous releases.
- Computer Vision:
  - Added 32-bit floating point input data support to the `ippiSegmentWatershed` function.
  - Added mirror border support to the following filtering functions: `ippiFilterGaussianBorder`, `ippiFilterLaplacianBorder`, `ippiMinEigenVal`, `ippiHarrisCorner`, `ippiPyramidLayerDown`, and `ippiPyramidLayerUp`.
- Signal Processing:
  - Added the `ippsThreshold_LTAbsVal` function, which uses the vector absolute value.
  - Added the `ippsIIR64f` functions to perform zero-phase digital IIR filtering.
- The multi-threaded libraries only depend on the OpenMP\* libraries; their dependencies on the other Intel® Compiler runtime libraries were removed



#### 4. Intel® System Debugger:

- Unified installer now for all components of the Intel® System Debugger (for system debug, system trace and WinDbg\* extension)
- Support for Eclipse\* 4.4 (Luna) integration with Intel® Trace Viewer
- New 'Trace Profiles' feature for System Trace Viewer to configure the destination for streaming mode for:
  - BIOS Reserved Trace Memory
  - Intel® Trace Hub Memory
  - Streaming to DCI-Closed Chassis Adapter (BSSB CCA)
- Tracing to memory support (Intel® Trace Hub or system DRAM memory) for 6<sup>th</sup> Gen Intel® Core™ processors (PCH) via Intel® XDP3 JTAG probe.
- Various stability bug fixes in Trace Viewer: Handling of decoder-instance-parameters. Crash on stop capture. Errors resulting from renaming capture files. Fix for persistent page up/down navigation. Decoding linked files containing spaces in path. Sporadic Eclipse error when switching target
- Trace Viewer improvements: Event distribution viewer. New progress bar when stopping a trace to memory. Rules are saved now in Eclipse workspace and restored during Eclipse restart. Improved memory download with wrapping enabled.
- Debugging support for Intel® Xeon® Processor D-1500 Product Family on the Grangeville platform.
- System Debugger improvements: Export memory window to text file.

#### 5. Intel® Graphics Performance Analyzers (Intel® GPA)

- Added support for 32-bit and 64-bit applications on Android M (6.0, Marshmallow).
- Intel Graphics Performance Analyzers are now in a single package for Windows users.
- Added support for OS X 10.11 El Capitan.
- Implemented texture storage parameters modification experiment - you can now change dimensions and sample count parameters for input textures without recompiling your app.
- Can now export textures in KTX/DDS/PNG file formats.
- And much more....

View the full [release notes](#) for more details.

#### 6. Intel® VTune™ Amplifier for Systems

- Support for the Microsoft Windows\* 10 November update
- Support for the ITT Counters API used to observe user-defined global characteristic counters that are unknown to the VTune Amplifier
- Support for the Load Module API used to analyze code that is loaded in an alternate location that is not accessible by the VTune Amplifier
- Option to limit the collected data size by setting a timer to save tracing data only for the specified last seconds of the data collection added for hardware event-based sampling analysis types
- New Arbitrary Targets group added to create command line configurations to be launched from a different host. This option is especially useful for microarchitecture analysis since it provides easy access to the hardware events available on a platform you choose for configuration.

- Source/Assembly analysis available for OpenCL™ kernels (with no metrics data)
- SGX Hotspots analysis support for identifying hotspots inside security enclaves for systems with the Intel Software Guard Extensions (Intel SGX) feature enabled
- Metric-based navigation between call stack types replacing the former Data of Interest selection
- Updated filter bar options, including the selection of a filtering metric used to calculate the contribution of the selected program unit (module, thread, and so on)
- DRAM Bandwidth overtime and histogram data is scaled according to the maximum achievable DRAM bandwidth

## 7. Intel® Inspector

- Support for the Microsoft Windows\* 10 OS support
- Support for Microsoft Visual Studio\* 2015 IDE integration

## Intel® System Studio 2016 Update 1 for Windows\*

### 1. Intel® C++ Compiler:

- Enhancements for offloading to Intel® Graphics Technology
- Support for Windows\* 10
- Support for Microsoft Visual Studio\* 2015

### 2. Intel® Energy Profiler (SoC Watch):

- Added support for collection of gfx-cstate and ddr-bw metrics on platforms based on Intel® Core™ architecture.

### 3. Intel® System Debugger:

- New options for the debugger's "Restart" command
- System Trace Viewer:
  - New "Event Distribution View" feature
  - Several improvements in the Trace Viewer GUI.

## 3 Intel® Software Manager

The Intel® Software Manager, automatically installed with the Intel® System Studio product, is a Windows System Tray application to provide a simplified delivery mechanism for product updates, current license status and news on all installed Intel software products.

You can also volunteer to provide Intel anonymous usage information about these products to help guide future product design. This option, the Intel® Software Improvement Program, is not enabled by default – you can opt-in during installation or at a later time, and may opt-out at any time. For more information please see <http://intel.ly/SoftwareImprovementProgram>.

## 4 Product Contents

The product contains the following components

1. Intel® C++ Compiler 16.0 Update 3
2. Intel® Integrated Performance Primitives 9.0 Update 3
3. Intel® Math Kernel Library 11.3 Update 3
4. Intel® Threading Building Blocks 4.4 Update 4
5. Intel® Graphics Performance Analyzers 2016 R1
6. Intel® VTune™ Amplifier 2016 Update 3 for Systems with Intel® Energy Profiler
7. Intel® Inspector 2016 for Systems
8. Intel® System Debugger 2016
  - 8.1. Intel® System Debugger notification module xdbntf.ko (provided under GNU General Public License v2)
9. Intel® Debug Extensions for WinDbg\* 2016
10. OpenOCD 0.8.0 library (provided under GNU General Public License v2+) (64-bit host only)
  - 10.1. OpenOCD 0.8.0 source (provided under GNU General Public License v2+)

## 5 Getting Started

Please refer to the Getting Started Guide and Intel® System Studio User's Guide for guidance on Intel® System Studio use cases and supported usage models.

The following paths are given relative to the installation directory <install-dir>. The default installation directory is C:\Program Files (x86)\IntelSWTools unless indicated differently.

### Intel® System Studio Installation Notes

#### Intel® System Studio User's Guide

- <install-dir>\documentation\_2016\en\iss2016\iss\_ug.pdf

#### Intel® System Studio Getting Started Guide

- <install-dir>\documentation\_2016\en\iss2016\iss\_gsg\_win\_win.htm

## 6 Technical Support and Documentation

### 6.1 Release Notes and User Guides Location

The release notes and getting started guide for the tools components making up the Intel® System Studio product can be found at the following locations after installation is complete.

#### Intel® System Studio Release Notes and Installation Guide

- `<install-dir>\documentation_2016\en\iss2016\w-all-release-install.pdf`

#### Intel® C++ Compiler

- `<install-dir>\documentation_2016\en\compiler_c\ReleaseNotes_ISS_Compiler.pdf`
- `<install-dir>/documentation_2016/en/compiler_c/iss2016/1_a_compiler_get_started.htm`

#### Intel® Integrated Performance Primitives

- `<install-dir>\documentation_2016\en\ipp\iss2016\ReleaseNotes.htm`
- `<install-dir>\documentation_2016\en\ipp\common\get_started.htm`

#### Intel® Math Kernel Library

- `<install-dir>\documentation_2016\en\mkl\common\Release_Notes.htm`
- `<install-dir>\documentation_2016\en\mkl\iss2016\get_started.htm`

#### Intel® Threading Building Blocks

- `<install-dir>\documentation_2016\en\tbb\common\Release_Notes.txt`
- `<install-dir>\documentation_2016\en\tbb\common\get_started.htm`

#### Intel® System Debugger

- `<install-dir>\documentation_2016\en\debugger\iss2016\system_debugger\system_debug\sysdebug-release-install.pdf`
- `<install-dir>\documentation_2016\en\debugger\iss2016\system_debugger\system_trace\systrace-release-install.pdf`
- `<install-dir>\documentation_2016\en\debugger\iss2016\system_debugger\system_trace\system-trace-user-guide.pdf`
- `<install-dir>\documentation_2016\en\debugger\iss2016\windbg-ext\windbg-release-install.pdf`
- `<install-dir>\documentation_2016\en\debugger\iss2016\windbg-ext\windbg-ext-pt.pdf`
- `<install-dir>\documentation_2016\en\debugger\iss2016\system_debugger\get_started.htm`

## Intel® VTune™ Amplifier

- <install-dir>\Vtune Amplifier for Systems\documentation\en\release\_notes\_amplifier\_for\_systems\_windows.pdf
- <install-dir>\Vtune Amplifier for Systems\documentation\en\amplsys\_install\_guide\_windows.pdf
- <install-dir>\Vtune Amplifier for Systems\documentation\en\SEP\_Users\_Guide.pdf
- <install-dir>\Vtune Amplifier for Systems\documentation\en\emon\_user\_guide.pdf
- <install-dir>\Vtune Amplifier for Systems\documentation\en\socwatch\_<OS>\_release\_notes.pdf
- <install-dir>\Vtune Amplifier for Systems\documentation\en\socwatch\_<OS>\_users\_guide.pdf

## Intel® Inspector

- <install-dir>\Inspector for Systems\documentation\en\Release\_Notes\_Inspector\_Windows.pdf

## Intel® Graphics Performance Analyzers (Intel® GPA)

Release Notes of the latest Intel® GPA 2016 R1 release can be found at:

- <https://software.intel.com/en-us/articles/intel-gpa-release-notes>

Documentation of the Intel® GPA is available at:

- <https://software.intel.com/en-us/articles/intel-gpa-online-help>
- <https://software.intel.com/en-us/gpa/documentation> .

## 6.2 Article & Whitepaper Locations

### Intel® System Studio Tutorials and Samples

- <install-dir>\documentation\_2016\en\iss2016\samples-and-tutorials.html

### Intel® System Studio Articles and Whitepapers

- <https://software.intel.com/en-us/articles/intel-system-studio-articles>
- For a list of all available articles, whitepapers and related resources please visit the Intel® System Studio product page at <http://software.intel.com/en-us/intel-system-studio> and look at the Support tab.

## 6.3 Support

If you did not register your compiler during installation, please do so 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.

To submit issues related to this product please visit the [Intel Premier Support](#) webpage and submit issues under the product **Intel(R) System Studio**.

Additionally you may submit questions and browse issues in the [Intel® System Studio User Forum](#).

For information about how to find Technical Support, product documentation and samples, please visit <http://software.intel.com/en-us/intel-system-studio>.

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

## 7 System Requirements

### 7.1 Supported Host Platforms

One of the following operation distributions (this is the list of distributions supported by all components; other distributions may or may not work and are not recommended - please refer to Technical Support if you have questions).

Windows\* 7, 8.x, 10

Individual Intel® System Studio 2016 components may support additional distributions. Please refer to the release notes of the respective components (section '6.1 Release Notes and User Guides Locations').

### 7.2 Microsoft\* Visual Studio\* Integration

The prerequisite for successful Microsoft\* Visual Studio\* integration and use of use the Microsoft Visual Studio\* development environment or command-line tools to build IA-32 or Intel® 64 architecture applications, is the presence of one of:

- Microsoft Visual Studio 2015\*
- Microsoft Visual Studio 2013\* Professional Edition (or higher edition) with C++ component installed
- Microsoft Visual Studio 2012\* Professional Edition (or higher edition) with C++ component installed
- Microsoft Visual Studio 2010\* Professional Edition (or higher edition) with C++ and "X64 Compiler and Tools" components installed

To use command-line tools only to build IA-32 architecture applications, one of:

- Microsoft Visual C++ Express 2013 for Windows Desktop\*
- Microsoft Visual C++ Express 2012 for Windows Desktop\*
- Microsoft Visual C++ 2010\* Express Edition

To use command-line tools only to build Intel® 64 architecture applications, one of:

- Microsoft Visual C++ Express 2013 for Windows Desktop\*
- Microsoft Visual C++ Express 2012 for Windows Desktop\*
- Microsoft Windows\* Software Development Kit for Windows 8\* or 8.1\*

### 7.3 Eclipse\* Integration Prerequisites

During System Studio installation you have the option to integrate the Intel® System Debugger Trace Viewer into an existing Eclipse\* installation, install Eclipse\* that is included in the System Studio package or skip Eclipse integration at all.

If you decide to integrate System Studio tools into your existing Eclipse\* installation (usually this would be `C:\Program Files (x86)\eclipse\`), make sure the prerequisites meet the following:

- Eclipse\* IDE for C/C++ Developers, supported versions 3.8/4.2 (Juno) – Eclipse\* 4.5 (Mars.2)
- Java Runtime Environment (JRE) version 6.0 (also called 1.6) update 11 or later.

#### 7.4 Hardware Requirements

- IA32 or Intel® 64 architecture based host computer supporting the Intel® Streaming SIMD Extensions 2 (Intel® SSE2) instructions (Intel® Pentium® 4 processor or later), or compatible non-Intel processor
  - For the best experience, a multi-core or multi-processor system is recommended
- Development target platform based on the Intel® Atom™ processor Z5xx, N4xx, N5xx, D5xx, E6xx, N2xxx, D2xxx, Z2xxx, Z3xxx, E3xxx, C2xxx or Intel® Atom™ processor CE4xxx, CE53xx and the Intel® Puma™ 6 Media Gateway
- Alternatively development platform based on 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> generation Intel® Core™ processor.
- Xeon® processors based on 2<sup>nd</sup>, 3<sup>rd</sup> 4<sup>th</sup> or 5<sup>th</sup> generation Intel® Core™ architecture.

#### 7.5 Host Prerequisites and Resource Requirements

##### 7.5.1 Host Space Requirements by Component

	Minimum RAM	Recommended RAM	Disk Space
<b>Intel® System Studio</b>	2Gb	4Gb	5Gb
<b>Intel® C++ Compiler</b>	1Gb	2Gb	2.5Gb
<b>Intel® Integrated Performance Primitives</b>	1Gb	4Gb	1-2Gb
<b>Intel® Math Kernel Library</b>	1Gb	4Gb	2.3Gb
<b>Intel® VTune™ Amplifier for Systems</b>	2Gb	4Gb	650Mb
<b>Intel® Inspector for Systems</b>	2Gb	4Gb	350Mb
<b>Intel® Threading Building Blocks</b>	1Gb	2Gb	300Mb

##### 7.5.2 Intel® Integrated Performance Primitives (Intel® IPP) Details

Intel® Integrated Performance Primitives (Intel® IPP) for IA-32 Hardware Requirements:

- 1800MB of free hard disk space, plus an additional 400MB during installation for download and temporary files.

Intel® Integrated Performance Primitives (Intel® IPP) for Intel® 64 Hardware Requirements:

- 1900MB of free hard disk space, plus an additional 700MB during installation for download and temporary files.



## 7.6 Target Software Requirements

The target platform should be based on one of the following environments:

- Microsoft Windows\* 7, 8.x, 10
- Microsoft Windows\* Embedded Standard 7, 8.x, 10

**Note:**

The level of target OS support by a specific Intel® System Studio component may vary.

## 7.7 Target Prerequisites and Resource Requirements

### 7.7.1 Target Space Requirement by Component

	Minimum RAM	Dependencies	Disk Space
<b>Intel® C++ Compiler</b>	application dependent	Linux kernel 1.26.18 or newer glibc-2.5 or compatible libgcc-4.1.2 or compatible libstdc++-3.4.7 or compatible	13Mb (IA-32) 15Mb (Intel® 64)
<b>Intel® VTune™ Amplifier CLI</b>	4Gb	Specific kernel configuration reqs. Details below.	200Mb
<b>Intel® VTune™ Amplifier SEP</b>	(# logical cores+2) Mb	Specific kernel configuration reqs. Details below.	8Mb
<b>SoC Watch</b>	(# logical cores+2) Mb	Specific kernel configuration reqs. See SoCWatch documentation	8Mb

## 7.8 Intel® Graphics Technology development specific requirements

Up-to-date information on hardware, operating system and driver requirements for offloading computations to the integrated processor graphics can be found on the following page:

<https://software.intel.com/en-us/articles/getting-started-with-compute-offload-to-intelr-graphics-technology>

## 8 Installation Notes

### 8.1 Installing the Tool Suite

The installation process as well as prerequisites for using the different Intel® System Studio components are documented online and can be found here:

<https://software.intel.com/en-us/articles/system-studio-install-prerequisites>

The default base installation, in the following referred to as <install-dir> directory is:

```
C:\Program Files (x86)\IntelSWTools
```

**Important Note:** As indicated in the installation process, Intel® System Studio 2015 customers need to upgrade their license either by entering an Intel® System Studio **2016** serial number directly or by obtaining the new license file from Intel® Registration Center. More information on this can be found on the following page:

<https://software.intel.com/en-us/articles/required-license-upgrade-for-intel-system-studio-2016-and-intel-parallel-studio-xe-2016>

#### 8.1.1 Running the Installer

You have the choice to use the online installer which is a small agent that downloads installation packages according to the products you will choose for installation.

Alternatively you can use the full package offline installer which doesn't require an Internet connection for installation.

To start installation, run one of the following (you must have administrator rights):

- Double-click the downloaded online installer agent  
system\_studio\_2016.3.xxx\_windows\_target\_online.exe  
or
- Double-click the downloaded full package offline installer  
system\_studio\_2016.3.xxx\_windows\_target.exe

#### 8.1.2 Activating the Product

During installation of the Intel® System Studio 2016 an activation dialog pops up providing the following options

- **Use existing activation** (this option is visible when the product installer recognized an existing valid license on the system)
- **Activation with Serial Number.** (“Online Activation”, requires Internet connection; the format of the serial number is: xxxx-xxxxxxx)
- **Evaluation activation** (no serial number required; installs a 30-days license on the system with full functionality)
- **Use a license manager** (license manager must be running and accessible from the install machine)

- **Use license file** (license file .lic must be available on the install machine, no internet connection required)

The Intel® Software Manager (see section. 3) can be used to manage your activations after product installation. It can for example convert an evaluation activation into a full product activation (after product license purchase) without re-installing the product.

### 8.1.3 Default / Customized Installation

When the Installation Summary dialog pops up, just click the 'Next' for a default installation or on 'Customize' button to modify the list of components to install.

## 8.2 Uninstalling / Modifying / Repairing the Tool Suite

You can uninstall the complete product, modify (if you want to uninstall specific component or install new components) or repair an installation (if you think something has broken). You can choose one of the following

- Start the Windows\* system's Control Panel, choose '*Uninstall a program*' / *Intel System Studio 2016 [Update #]*  
or
- Run the `c:\Program Files (x86)\Intel\Download\system_studio_2016.3.xxx_windows_target\setup.exe`

and choose the desired option, '**Modify**', '**Repair**' or '**Remove**'

### 8.3 Installation Directory Structure

Intel® System Studio for Windows\* 2016 installs components which are unique to System Studio into `<install-dir>\system_studio_for_windows_2016.3.xxx` and components which share subcomponents (such as documentation) with other Intel® Software Development Products into `<install-dir>`.

The Intel® System Studio for Windows\* 2016 installation directory contains tools and directories as well as links to shared components into the parent directory for Intel® C++ Compiler, Intel® Integrated Performance Primitives, Intel® Math Kernel Library, Intel® Threading Building Blocks, Intel® System Debugger, Intel® VTune™ Amplifier and Intel® Inspector respectively as follows:

- `<install-dir>\system_studio_for_windows_2016.3.xxx\compilers_and_libraries_2016`
- `<install-dir>\system_studio_for_windows_2016.3.xxx\debugger`
- `<install-dir>\system_studio_for_windows_2016.3.xxx\documentation_2016`
- `<install-dir>\system_studio_for_windows_2016.3.xxx\GPA`
- `<install-dir>\system_studio_for_windows_2016.3.xxx\Inspector for Systems`
- `<install-dir>\system_studio_for_windows_2016.3.xxx\licensing`

- <install-dir>\system\_studio\_for\_windows\_2016.3.xxx\samples\_2016
- <install-dir>\system\_studio\_for\_windows\_2016.3.xxx\VTune Amplifier for Systems

## Intel® Software Development Products Common Components Directory with Links from System Studio

- <install-dir>\compilers\_and\_libraries
- <install-dir>\compilers\_and\_libraries\_2016
- <install-dir>\compilers\_and\_libraries\_2016.3.xxx
- <install-dir>\documentation\_2016
- <install-dir>\eclipse
- <install-dir>\GPA\_2016
- <install-dir>\Inspector 2016 for Systems
- <install-dir>\Inspector for Systems
- <install-dir>\samples\_2016
- <install-dir>\System Debugger 2016
- <install-dir>\system\_studio\_for\_windows\_2016.3.xxx\
- <install-dir>\VTune Amplifier 2016 for Systems
- <install-dir>\VTune Amplifier for Systems

**Note:** Please be aware that the presence of a Microsoft\* Visual Studio\* 2010 – 2015 installation is required for successful product installation and usage.

### 8.4 Ordering JTAG Probe for the Intel® System Debugger

1. To order the Intel XDP3 JTAG probe, please go to:  
[http://designintools.intel.com/product\\_p/itpxdp3brext.htm](http://designintools.intel.com/product_p/itpxdp3brext.htm) (ITP-XDP 3BRKit)
2. To order the closed-chassis adapter, please go to:  
[http://designintools.intel.com/product\\_p/itpxdpsvt.htm](http://designintools.intel.com/product_p/itpxdpsvt.htm) (Intel SVT Closed Chassis Adapter)

We will also gladly assist with the ordering process. If you have any questions please submit an issue in the Intel® System Studio product of Intel® Premier Support <https://premier.intel.com> or send an email to [IntelSystemStudio@intel.com](mailto:IntelSystemStudio@intel.com).

## 9 Issues and Limitations

### 9.1 Known Issues and Limitations

For known issues of individual Intel® System Studio components please refer to the individual component release notes. Their location in the installed product can be found in chapter 2:

[Technical Support and Documentation](#)

#### 9.1.1 MSBuild.exe should be closed before installation

During installation/uninstallation of Intel® System Studio 2016 for Windows you may get the following dialog:

**The following application should be closed before continuing the install:**

- MSBuild.exe

In order to continue installation/uninstallation, please, close MSBuild.exe process and click “Retry” button.

In order to avoid this situation, please, make sure MSBuild.exe process is closed before starting the installation/uninstallation of Intel® System Studio 2016 for Windows\*.

#### 9.1.2 Running online-installer behind proxy server fails

Running online-installer behind proxy server produces error: "Connection to the IRC site cannot be established". Please see the [Installation Notes](#) for more details

#### 9.1.3 No coexistence of Intel® Parallel Studio XE 2015 and Intel® System Studio 2016 Visual Studio\* Integration

If Intel® System Studio for Windows\* 2016 are installed on the same machine as Intel® Parallel Studio XE 2015, then the following issues may be observed:

1. Visual Studio\* displays dialog windows with error message that package is not loaded correctly.
2. Missing “Use Intel® C++” menu item in “Project -> Intel Compiler” context menu
3. Intel® C++ Compiler options do not load correctly in “Tools -> Options -> Intel Compilers and Tools” dialog.

The workaround is the following:

1. Open Microsoft Windows\* Explorer as Administrator and go to “<Visual Studio Install Directory>\Common7\IDE\Extensions\Intel\C++”
2. Copy \*.ISS.pkgdef files to \*.pkgdef files (overwrite existing .pkgdef files):

IntelPkg.<ISS>.pkgdef -> IntelPkg.pkgdef

IntelLibOptPkg.<ISS>.pkgdef -> IntelLibOptPkg.pkgdef

IntelCppOptPkg.<ISS>.pkgdef -> IntelCppOptPkg.pkgdef

ICProjConvPkg.<ISS>.pkgdef -> ICProjConvPkg.pkgdef

3. Go to <Visual Studio\* Install Directory>\Common7\IDE\Extensions\Intel\Common

4. Copy \*.ISS.pkgdef to \*.pkgdef files (overwrite existing .pkgdef files):

- Intel.CommonTools.<ISS>.pkgdef -> Intel.CommonTools.pkgdef
- Intel.CommonTools.OptPkg.<ISS>.pkgdef -> Intel.CommonTools.OptPkg.pkgdef

5. Open Developer command prompt for selected Visual Studio\*:

“Start -> All Programs -> Microsoft Visual Studio <2010|2012|2013|2015> -> Visual Studio\* Tools”

6. On command prompt type: devenv /setup

#### 9.1.4 Graphics Analysis Tools installation failure on Windows\* host with script custom actions

The installation of Intel® System Studio System Analyzer, Frame Analyzer and Platform Analyzer may fail on rare occasions with the following Windows\* error message:

1. 2738, Could not access VBScript run time for custom action [2].
2. 2739, Could not access JScript run time for custom action [2].

If this error message occurs, the installation can be completed after applying the following steps:

- Check that vbscript.dll and jscript.dll aren't registered in HKEY\_CURRENT\_USER (HKCU), checking for the registry keys below.
- VBScript, HKCU\SOFTWARE\Classes\CLSID\{ B54F3741-5B07-11CF-A4B0-00AA004A55E8}
- JScript, HKCU\SOFTWARE\Classes\CLSID\{ F414C260-6AC0-11CF-B6D1-00AA00BBBB58}
- JScript, HKCU\SOFTWARE\Classes\CLSID\{ F414C261-6AC0-11CF-B6D1-00AA00BBBB58}
- JScript, HKCU\SOFTWARE\Classes\CLSID\{ F414C262-6AC0-11CF-B6D1-00AA00BBBB58}
- Remove these keys if they exist in HKEY\_CURRENT\_USER.

#### 9.1.5 Some hyperlinks in HTML documents may not work when you use Internet Explorer.

Try using another browser, such as Chrome or Firefox, or right-click the link, select Copy shortcut, and paste the link into a new Internet Explorer window.

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This product includes software developed at:

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- the SAX project (<http://www.saxproject.org>)
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