



Intel® Advisor 2017 Release Notes - Windows* OS

Intel Corporation

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Intel® Advisor 2017 Release Notes

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Introduction

Intel® Advisor 2017 provides two tools to help ensure your Fortran and native/managed C++ applications take full performance advantage of today's processors:

- **Vectorization Advisor** is a vectorization analysis tool that lets you identify loops that will benefit most from vectorization, identify what is blocking effective vectorization, explore the benefit of alternative data reorganizations, and increase the confidence that vectorization is safe.
- **Threading Advisor** is a threading design and prototyping tool that lets you analyze, design, tune, and check threading design options without disrupting your normal development.

This document provides system requirements, installation instructions, issues and limitations, and legal information.

To learn more about this product visit our [web site](#) or refer to documentation:

- Documentation, help, and samples, open the `get_started.htm` file in the following directory: `<install-dir>\documentation_2017\<locale>\Advisor\welcomepage`. You can access the product help in a web browser as well by opening the `index.htm` file in the following directory: `<install-dir>\documentation_2017\<locale>\Advisor\help`. The default `<install-dir>` is `C:\Program Files (x86)\IntelSWTools`.
- Technical support, including answers to questions not addressed in the installed product, please visit: <http://software.intel.com/en-us/support/>

What's New

Intel® Advisor 2017 Update 5

- Added support for Intel® Xeon® Scalable Processors
- Added support for Windows Server 2016
- Bug fixes

Intel® Advisor 2017 Update 4

- Bug fixes

Intel® Advisor 2017 Update 3

- **Hierarchical Roofline:** To enable this preview feature, set the environment variable `ADVIXE_EXPERIMENTAL=roofline_ex` before launching the Intel Advisor (data re-collection may be required).
- Experimental support for accessing Advisor data via Python API. See examples in the `{INSTALL_DIR}/pythonapi/examples`. API is subject to change in the future releases.
- **New recommendations:**
 - Force scalar remainder for loops with low mask utilization on AVX512.
 - Extended "Gather recommendation" with "Constant (non-unit)" pattern.
- **Roofline enhancements:**
 - Customization of roof values and chart borders.
 - Persistence for roofs visibility and custom values (note that auto save delay is 20 seconds).
 - Improved scaling of histogram.

- Joined Survey and Refinement CLI report.
- MKL breakdown in Summary.
- Divided read/write access in Memory Access Patterns report.
- Added support for Microsoft Visual Studio* 2017.

Intel® Advisor 2017 Update 2

- General availability of **Cache-aware Roofline** performance characterization model, that graphically represents main performance limiting factors for the whole application and individual loops and functions.
- **Filter by module** for Survey, FLOPS and Trip Counts collections, that helps to decrease overhead and narrow down results for big applications.
- **Call Count** metric for function in addition to Trip Counts data.
- Trip Counts quality and coverage increased significantly.
- Ability to re-finalize Advisor Survey result in order to apply updated binary and source search paths.
- Support for cross-OS analysis to all license types. Download installation packages for additional operating systems from registrationcenter.intel.com.
- Added support for Fedora 25 and Ubuntu 16.10.

Intel® Advisor 2017 Update 1

- Added ability to track progress of refinement collections. You may decide to stop collection if every site was executed at least once.
- Added new category for instruction mix data "compute with memory operands".
- Exposed recommendations in refinement view with matching between survey rows and refinement sites.
- Added new recommendation to "Vectorize call(s) to virtual method".
- Recommendations are now cached into snapshot to speed up their opening and fix problem with rebuilt binaries.
- Added check for no-auto-finalize results with corresponding messages and Finalize button in GUI.
- Added MPI support to get command line dialog.
- Bug fixes

Intel® Advisor 2017

- Full support for Intel® Xeon Phi™ processor (codename : **Knights Landing**) for all analysis types.
- Precise **FLOPS** metric collection that considers usage of **masked** operations. FLOPS metrics are collected along with the Trip Counts analysis when enabled in project properties.
- Improved usability of multi-ISA binaries analysis, so you can see ISA and traits in the virtual loops and sort and find **AVX512 code paths** more easily.
- Loop Analytics tab with trip counts and extended **instruction mix** , so you can see compute vs memory instruction distribution, scalar vs vector, ISA details, etc.
- Exposed innermost loops with **vector intrinsics** as vectorized in the Survey grid.
- **Analysis workflow:**
 - **Batch mode** , which lets you automate collecting multiple analysis types at once with auto-selection for MAP and Dependencies analysis using pre-defined criteria.
 - New **"Smart mode"** for Survey results, which is an effective way to simplify data representation and to automatically select the loops that can be most impactful and/or suitable from a SIMD vector performance perspective.
 - Improved MPI flow: better support for non-Intel MPI libraries, enabled creating snapshots for MPI results. Project properties dialog was extended with command line **configuration for MPI** launcher.
 - Cross-highlighting between the Survey and Refinements report, so you can easily correlate loops in Survey and Dependencies/MAP analyses.
- **Memory analysis:**
 - Added simultaneous profiling of nested loops in MAP analysis. Memory access strides are now detected relatively to each of the profiled nested loops.

- **Gather and Scatter instructions** analysis with a special stride category in the Details section of MAP source view.
- **Variable names** detection in the Refinements report, including heap-allocated variables.
- More accurate memory **footprint metric**, showing the maximum footprint across all loop instances.
- **New recommendations:**
 - New recommendation to use **SDLT** for loops with an "Ineffective memory access" issue.
 - Consider outer loop vectorization in appropriate cases.
 - Consider refactoring the code to avoid using single Gather or Scatter instructions if the pattern is regular.

System Requirements

Supported Architectures and Terminology

Intel® Advisor supports the following architectures:

- **IA-32 Architecture** refers to systems based on 32-bit processors generally compatible with the Intel® Pentium® processors (for example, Intel® Pentium® 4 processor) or processors from other manufacturers supporting the same instruction set, running a 32-bit operating system.
- **Intel® 64 Architecture** refers to systems based on IA-32 architecture processors that have 64-bit architectural extensions, for example, Intel® Core™ processor family, running a 64-bit operating system such as Microsoft Windows XP* Professional x64 Edition or Microsoft Windows* 7 x64. If the system is running a 32-bit version of the Windows* operating system, then IA-32 architecture applies instead. Processors from other manufacturers supporting the same instruction set running a 64-bit version of the Windows operating system are also supported.

Minimum System Requirements

- A system based on an IA-32 or Intel 64 architecture processor supporting the Intel® Streaming SIMD Extensions 2 (Intel® SSE2) instructions (Intel Pentium 4 processor or later, or compatible non-Intel processor or Intel® Xeon® Scalable Processors)
 - Since the Intel Advisor requires specific knowledge of assembly-level instructions, its analysis may not operate correctly if code contains non-Intel instructions. In this case, run the analysis with a target executable that contains only Intel® instructions. After you finish using the Intel Advisor, you can use the assembler or optimizing compiler options that provide the non-Intel instructions.
 - For the best experience, a multi-core or multi-processor system is recommended
- 2GB RAM
- 4GB free disk space for all product features and architectures
- Supported operating systems:
 - Microsoft Windows* 7 SP1
 - Microsoft Windows Server* 2008 SP2 and 2008 R2 SP1, 32-bit or "x64" editions - embedded editions are not supported
 - Microsoft Windows 8* and 8.1* operating system
 - Microsoft Windows Server* 2012, 2012 R2 and 2016
 - Microsoft Windows 10* operating system
- Supported Microsoft Visual Studio (and Microsoft Visual C++* compiler) versions:
 - Microsoft Visual Studio* 2012
 - Microsoft Visual Studio* 2013
 - Microsoft Visual Studio* 2015
 - Microsoft Visual Studio* 2017
- Supported Intel compilers (optional):

- Intel® C++ Compiler 15 or higher
- Intel® Visual Fortran Compiler 15 or higher
- Native application coding requirements
 - Supported programming languages:
 - Fortran
 - C
 - C++
 - Supported threading methodologies:
 - Intel® Threading Building Blocks (Intel® TBB)
 - Intel® Cilk™ Plus
 - OpenMP
 - Windows* Threads (low-level)
 - Managed application coding requirements
 - Supported programming languages:
 - C# (.NET* versions 3.0 to 4.0)
 - Supported threading methodologies
 - C# Thread Class
 - Microsoft* Task Parallel Library (TPL)
- To view PDF documents, you need a PDF reader, such as Adobe Reader* 6 or later

Floating licensing service requirements

Intel® Software License Manager version 2.5, available on the [Intel® Registration Center](#) (choose the right OS and platform; only users with floating license registrations have access to this link).

For more details, please refer to the <https://software.intel.com/en-us/articles/intel-software-license-manager-getting-started-tutorial>

Notes:

1. Intel Advisor samples work with the Intel TBB by using the environment variable `TBBROOT`. Intel TBB is included with the Intel compiler and is available from <http://software.intel.com/en-us/intel-tbb/>. To build the Intel TBB projects, you will need to define the `TBBROOT` environment variable. To set the `TBBROOT` environment variable, see the Intel Advisor Help or Getting Started Tutorial.

Installation Notes

If you are installing the product for the first time, please be sure to have the product serial number available so you can type it in during installation. A valid license is required for installation and use.

To begin installation:

- Double-click on the executable file to begin installation. If several different downloadable files are available (such as for different components), please read the download web page carefully to determine which file is appropriate for you.

Activation

You must activate the product to finish installation. Use one of these methods:

- Activation using serial number. Internet connection is required;
- Remote activation using serial number. Used when your computer is not connected to the internet.

You can use another computer with internet access;

- Activation using license file;

- Activation using license server.

You can also evaluate the product for 31 days.

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Intel® Software Manager

Intel® Software Manager is a utility that allows users to:

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- Activate serial numbers.
- Find out about the latest news for Intel Software Development Products.
- Intel Software Manager requires an Internet connection to connect to a remote server for information and updates.

Intel Software Manager installs with Intel Software Development Products on Windows*, Linux*, and Mac OS* X operating systems.

To obtain more information about the Intel Software Manager, please refer to the <https://registrationcenter-ssl.intel.com/Docs/ism.htm> web-page.

Default Installation Folders

The default top-level installation folder for this product is

```
C:\Program Files (x86)\IntelSWTools\Advisor 2017
```

If you are installing on a system with a non-English language version of Windows OS, the name of the Program Files (x86) folder may be different. On IA-32 architecture systems, the folder name is Program Files.

This product installs into an arrangement of folders shown in the diagram below. Not all folders will be present in a given installation.

- C:\Program Files (x86)\IntelSWTools\Advisor 2017
 - bin32
 - bin64
 - config
 - documentation
 - include
 - lib32
 - lib64
 - message
 - resource
 - samples

Changing, Repairing and Removing the Product

If you want to modify, repair, or remove the Intel Advisor components, open the Control Panel and select the **Add or Remove Programs** applet (or **Programs and Features** in the Microsoft Windows 7 OS), select **Intel Advisor 2017** and click **Change/Remove** (or **Uninstall/Change** in the Microsoft Windows 7 OS). Follow the installation instructions. You may need the original installation files to complete this process. If you do not have the extracted files, you can use the original installer executable to complete this process as well.

Silent Installation

To learn details of silent non-interactive installation on Windows* systems, refer to the following link: http://software.intel.com/en-us/windows_silent_installation_guide.

Known Installation and Configuration Issues

- Please close Visual Studio sessions before installing, modifying, or removing the Intel Advisor from a non-administrator account. Not doing so will affect Visual Studio integration and may result in obscure error messages.

If you encounter problems viewing the Intel Parallel Studio XE (local) help: click **Help > Manage Help Settings > Settings**, and check **I want to use local help**. These set-up steps are needed only once.

- By default, Microsoft Visual Studio 2012 software sets the **Launch in Browser** option to display documentation for integrated products. To view the Intel Advisor local help documentation: Choose **Help > Intel Advisor 2017 Help** or use context-sensitive help. If you still encounter problems viewing the help, Choose **Help > Set Help Preferences > Launch in Help Viewer**.
- If you have multiple versions of Microsoft Visual Studio software installed on your system and integrate the Intel Advisor into each IDE, removing the integration from one of the IDEs will remove the integrated Intel Advisor documentation from both.

There are two options to restore the documentation:

First option:

1. Open the Intel Parallel Studio XE command prompt: **Start > All Programs > Intel Parallel Studio XE 2017 > Analyzers > Command prompt**. You can choose any shortcut here, for example, "IA-32 Visual Studio 2012 mode").
2. Remove the integration for the Visual Studio version that is missing integrated help. For example, to remove the Intel Advisor integration:

With:	Type:
Visual Studio 2012	<code>advixe-vsreg -d 2012</code>

3. Restore the integration. For example, to restore the Intel Advisor integration:

With:	Type:
Visual Studio 2012	<code>advixe-vsreg -i 2012</code>

- Second option:
 - Uninstall the product.
 - Install it again with the desired Visual Studio integration selected.

Issues and Limitations

Known Issues and Limitations

- Intel® Advisor may display a message that the "Project is out of date" before running the data collectors. You do not need to rebuild the project prior to running the collector if you know that the project is up-to-date.
- The Suitability tool cannot accurately measure and analyze the behavior of loops with very small task times (on the order of sub-microseconds) if those tasks are annotated with the `TASK_BEGIN/TASK_END` annotations. If possible, use the `ITERATION_TASK` annotation instead.
- The Suitability Report combines all lock data into a single lock and may not have source line information for `LOCK_ACQUIRE` and `LOCK_RELEASE` annotations.
- If your sources include huge source files that contain annotations, be aware that only the first 8 MB of each file will be parsed for annotations. If not all of your annotations are being parsed in such huge source files, consider breaking that source file into several source files each less than 8MB.
- When opening the Intel Advisor samples, Visual Studio software will display a warning message related to Intel Cilk Plus projects or list them as unsupported when the Intel C++ Compiler is not installed. This message may be ignored. However, Intel Cilk Plus projects will not compile without an Intel C++ Compiler with Intel Cilk Plus support, such as the Intel Parallel Studio XE (or similar Intel software suite).
- In the Correctness Report, the following sequence of actions may cause the Intel Advisor and Visual Studio software to crash: select the "Not fixed" **State** filter category in the Filter pane, mark the last remaining "Not fixed" problem as fixed in the Observation pane, and then remove the "Not fixed" filter by clicking the **All** button in the **State** filter or clicking the **Deselect all search criteria** button. To workaround this issue do one of the following:
 1. Avoid marking the last remaining problem as "Fixed" in the Observation pane while the "Not fixed" filter is applied.
 2. Avoid removing the "Not fixed" filter if all of the problems have been marked as "Fixed".
- The Survey Report may incorrectly report loops if a function contains calls to a non-returning function such as the `exit()` function.
- Loops within a function that does not contain debug information may not be reported as a loop in the Survey Report. For the suggested build settings, see the help topics under Choosing and Building a Target > Build Settings. After you fix the build settings to specify debug information, rebuild the target and run Survey analysis again.
- After analyzing the specified target executable, the Survey tool may report that no significant hotspot areas were detected. In this case, view the collected result using the Survey Report window. The suggested build settings are described in the help topics under Choosing and Building a Target > Build Settings.
- If debug information correlating an instruction to source code is not available to an Intel Advisor tool, the tool cannot correlate collected data with source code. In this case it will show an empty field, question mark, or broken icon. Source correlation may not be available for many different reasons, including:
 1. Omitting debug information options when building the target executable - see the help topics under Choosing and Building a Target > Build Settings.
 2. A compiler error.
 3. The compiler not generating debug information for this specific source line.
 4. The compiler not generating debug information for this specific source file.
 5. The linker not copying the debug information into the debug information database.
 6. The debug information database not being found by the finalization step in the Intel Advisor, because it was not moved along with the executable to the location where the Intel Advisor is being run.
 7. When using the Intel Advisor GUI, insufficient project properties were specified for the Binary/Symbol Search tab. In this case, see the help topic Specifying Project Properties Using the Intel Advisor GUI.

- Do not close the Intel Advisor GUI or Visual Studio software while expanding the Survey tree. Doing so may cause the product to crash or hang.
- Intel Advisor may present incorrect or incomplete information if local character sets are used. For general character set support, use Unicode.
- To build the Intel TBB versions of the samples using Visual Studio 2012, make sure the Intel TBB version installed is 4.1 or higher.
- On Windows Server 2012 systems, if you have problems viewing Microsoft Visual Studio 2012 help pages, check the settings for Internet Explorer in **Tools > Internet Options > Security**. To allow correct display of help, in the **Internet zone** enable **MIME Sniffing** and **Active scripting**.
- On Windows Server 2012 systems, if you find that you cannot display Getting Started Tutorials from within Internet Explorer 10, correcting a security setting for Microsoft Internet Explorer usually corrects the problem. From **Tools > Internet Options > Security**, add "about:internet" to the list of trusted sites. Optionally, you can remove "about:internet" from the list of trusted sites after you are finished viewing the documentation.
- Virus checking can sometimes interfere with our ability to instrument code. The following error indicates the virus checker has modified `ntdll.dll`, which will cause our collections to fail. Currently there is no workaround, except turning off the virus checker. This issue will be resolved in the next product update.

Collection failed

8/23/2017 1:26:10 PM Collection failed. The data cannot be displayed.

```
[Instrumentation Engine]: SYSCALL_INSPECTOR: The NTDLL!NtTerminateThread function jumps out of NTDLL, at 0x7ffeb0fe00c4. It may be hooked by a PIN-incompatible software installed on the system Source\pin\base_w\ipc_server_windows.cpp: LEVEL_BASE::StartServer: 2216: assertion failed: res == TRUE
```

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```
printf("%s",png_get_copyright(NULL));
```

Also, the PNG logo (in PNG format, of course) is supplied in the files "pngbar.png" and "pngbar.jpg (88x31) and "pngnow.png" (98x31).

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Glenn Randers-Pehrson

glennrp at users.sourceforge.net

June 14, 2012

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Libunwind

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Changes to standard library modules:

A brief summary of changes made to Python 2.5.2 source:

- On Windows*, the code of import, zipimport, and execfile was modified to handle directories containing Unicode characters.

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zlib.h

zlib.h -- interface of the 'zlib' general purpose compression library

version 1.2.3, July 18th, 2005

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