

Intel® VTune™ Amplifier XE 2016 Release Notes for Windows* OS

Installation Guide and Release Notes

19 April 2016

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You can find the latest Release Notes versions [online](#).

1 Performance Profiling with Intel VTune Amplifier XE

Please visit our [web site](#) for training videos, technical articles, documentation and support.

Intel® Parallel Studio XE users: Intel® Advisor XE can now assist with vectorization optimization. If you have Intel Parallel Studio XE Professional or Cluster Edition it may already be installed. See <https://software.intel.com/en-us/intel-advisor-xe> for details.

2 What's New

Intel® VTune™ Amplifier XE 2016 Update 3:

- Detection of the **OpenCL™ 2.0 Shared Virtual Memory (SVM)** usage types per kernel instance
- **Arbitrary targets** command line configuration extended with MPI launcher options
- Driverless event-based sampling collection for uncore events enabled for the **Memory Access** analysis
- **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

- Support for the next generation **Intel® Xeon® Processor E5 v4 Family** (formerly codenamed "Broadwell-EP")
- Support for the Microsoft* Visual Studio 2015 Update 2

Intel® VTune™ Amplifier XE 2016 Update 2

- 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)
- 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
- HPC Characterization analysis that monitors utilization of the CPU, memory, and FPU for a compute-intensive or throughput application and helps identify floating point operation and memory optimization opportunities. This is a preview feature. Preview feature may or may not appear in a future production release. It is available for your use in the hopes that you will provide feedback on its usefulness and help determine its future. Data collected with a preview feature is not guaranteed to be backward compatible with future releases. Please send your feedback to parallel.studio.support@intel.com in the next 30 days.
- Default project configuration changed to apply existing target (thresholds for frame rate, region/ interrupt/function duration) and filtering (call stack mode, inline mode, loop mode) settings to all subsequent results generated for this project
- New option to measure the maximum local bandwidth and use this data to scale the DRAM Bandwidth overtime view and calculate the bandwidth histogram thresholds
- Support for the Fedora* 23, Ubuntu* 15.10
- Support for the Microsoft Windows* 10 November update

Intel® VTune™ Amplifier XE 2016 Update 1

- General Exploration analysis for Intel microarchitecture codename Cherry Trail
- Event-based sampling collection for multiple ranks per node with an arbitrary MPI launcher
- Command-line option `-knob event-config` extended to display a list of PMU events available on the target system

- Event-based sampling collection support for .NET* processes (.NET 4.0 and higher) in the attach mode
- Algorithm analysis views extended to display confidence indication (greyed out font) for non-reliable metrics data resulted, for example, from the low number of collected samples
- Support for Intel® Manycore Platform Software Stack (Intel® MPSS) version 3.6

Intel® VTune™ Amplifier XE 2016 (since 2015 release)

- **OpenMP*** analysis enhancements with:
 - **Spin** and **Overhead Time** metrics classified by reasons for OpenMP* analysis
 - **Potential Gain** expansion by parallelization inefficiencies representing their wall time cost
 - **Precise trace-based imbalance** calculation that is especially useful for profiling of small region instances. Requires Intel® Composer XE 2015 Update 3 or higher
 - Detailed analysis by barrier-to-barrier region segments to explore performance of OpenMP work-sharing constructs and barrier cost inside a region
 - Display of **atomic operations cost** and **iteration counts** (min/max/average) per parallel loop and identifying the iterations insufficient to saturate working threads
 - Direct access to the source analysis for an OpenMP parallel region when using the /OpenMP Region/.. granularity in the grid
- **OpenMP and MPI multi-rank analysis** on a compute node with:
 - MPI rank ID automatically embedded into an MPI process name to better distinguish multiple ranks for Intel MPI analysis
 - New **trace-mpi** knob CLI option and Trace MPI GUI target configuration option for enabling collectors to determine MPI rank IDs in case of a non-Intel MPI library implementation
 - Per-rank Intel MPI communication busy wait time detected and displayed in the Summary, grid and Timeline views
 - Selective rank profiling for MPI applications, including Microarchitecture analysis for multiple ranks on a node by using Intel MPI library v5.0.3 or higher
 - VTune Amplifier XE command line generation for selective rank profiling through Intel Trace Analyzer and Collector v9.0.2 or higher
- **GPU analysis** improvements including:

- Support for Intel microarchitectures code name Broadwell, Skylake, Braswell and Cherry Trail.
- **CPU/GPU Concurrency** analysis using a predefined configuration to explore GPU usage per basic hardware metrics and correlate this data with the CPU usage at the same time frames
- Support for analyzing applications using **Intel® HD Graphics on Linux* OS**, including:
 - Intel® HD Graphics Driver 16.4.2.1.X or newer version is required for analyzing processor graphics hardware metrics on Linux*
 - **GPU usage analysis** including the **GPU hardware metrics**
 - **GPU Architecture Diagram** added to the **Timeline** pane to facilitate interpretation of the OpenCL™ application analysis data and easily match the GPU hardware metrics with the corresponding architecture blocks
 - **OpenCL** application analysis (for Intel HD Graphics), including display of compute-originated batch buffers on the GPU software queue in the Timeline pane
 - **Intel Media SDK** program analysis, including display of information on packet submission in the Timeline pane
- **Microarchitecture Analysis** enhancements:
 - **General Exploration** analysis views extended to display confidence indication (greyed out font) for non-reliable metrics data resulted, for example, from the low number of collected samples
 - **General Exploration** analysis support for the 6th Generation Intel® Core™ processors (code name: Skylake)
 - Optimized configuration for the **Microarchitecture Analysis** that now includes platform-independent analysis types
 - **Hardware Events** viewpoint, displaying an estimated count and/or the number of collected samples, replaced **Hardware Event Counts** and **Hardware Event Sample Counts** viewpoints
 - Support for **Perf* based driverless hardware event-based sampling collection with stacks**
 - **Loop trip count** collection level supported for the Advanced Hotspots and custom hardware-event-based sampling analysis types

- Intel Processor Event Reference integrated into the VTune Amplifier help system
- Hardware event-based stack sampling collection supported for kernel-mode threads for Linux targets
- New **Memory Access** analysis that replaces the Bandwidth analysis (now deprecated) and extends its functionality to:
 - Identify memory-related issues, including bandwidth issues
 - Provide configuration options to attribute performance events to memory objects (data structures) for Linux targets.
 - Support the 5th Generation Intel® Core™ processors (code name: Broadwell) and Intel microarchitecture code name Silvermont
 - Provide Intel® QuickPath Interconnect (Intel® QPI) Bandwidth data analysis for server platforms
 - Present Total, Read and Write Bandwidth timeline areas in a single area
 - Group the CPU Time timeline area by package
- Intel® **Transactional Synchronization Extensions** (Intel TSX) **Hotspots** analysis that helps analyze hotspots inside transactions on processors starting with the Intel microarchitecture code name Haswell
- User Interface enhancements:
 - Optimized project configuration that provides a straightforward workflow for specifying an analysis target (formerly, Project Properties dialog box) and analysis type within the same **Choose Target** and **Analysis Type** window
 - Support for the *?* CLI argument for **filter**, **group-by** and **column** options to get a list of option values available for the specified report
 - CLI reports synchronized with the data provided in the **Top-down** and **Bottom-up** views of the GUI viewpoints
 - New filtering mode for command line reports to display data for the specified column names only
- Result view:
 - **Super Tiny** display mode added for the **Timeline** pane to easily identify problem areas for results with multiple processes/threads

- **Platform** window replacing the **Tasks and Frames** window and providing CPU, GPU, and Bandwidth metrics data distributed over time
- ITT User API enhancements:
 - Support for analysis of ITT API applications running in the Attach to Process mode
 - Attach to Process target type supported for user-mode sampling and tracing analysis of Java* applications on Linux OS
 - Support for the `__itt_detach` API to detach collection from all processes
- New [VTune Amplifier XE Installation Guide](#) providing detailed instructions on installing the product, building/loading drivers, and so on
- Support for Intel microarchitectures code name Haswell-EP, Broadwell, Skylake, Braswell and Cherry Trail
- Support for Intel® Manycore Platform Software Stack (Intel® MPSS) version 3.5
- Microsoft Visual Studio* 2015 IDE integration
- Microsoft Windows* 10 OS support

3 System Requirements

For an explanation of architecture names, see <http://software.intel.com/en-us/articles/intel-architecture-platform-terminology/>

Processor Requirements

- For general operations with user interface and all data collection except Hardware event-based sampling analysis
 - A PC 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).
 - For the best experience, a multi-core or multi-processor system is recommended.
 - Because the VTune Amplifier XE requires specific knowledge of assembly-level instructions, its analysis may not operate correctly if a program contains non-Intel instructions. In this case, run the analysis with a target executable that contains only Intel® instructions. After you finish using the VTune Amplifier XE, you can use the assembler code or optimizing compiler options that provide the non-Intel instructions.
- For Hardware event-based sampling analysis (EBS)

- EBS analysis makes use of the on-chip Performance Monitoring Unit (PMU) and requires a genuine Intel processor for collection. EBS analysis is supported on Intel® Pentium® M, Intel® Core™ microarchitecture and newer processors (for more precise details, see the list below).
 - EBS analysis is not supported on the Intel Pentium 4 processor family (Intel® NetBurst® MicroArchitecture) and non-Intel processors.
 - However, the results collected with EBS can be analyzed using any system meeting the less restrictive general operation requirements.
 - EBS analysis within a virtual machine is supported only in VMware Fusion* 5 virtual environment. EBS is not supported within other virtual machine environments.
- The list of supported processors is constantly being extended. Here is a partial list of processors where the EBS analysis is enabled:

Mobile Processors

Intel® Atom™ Processor

Intel® Core™ i7 Mobile Processor Extreme Edition (including 2nd, 3rd, 4th and 5th Generation Intel® Core™ processors)

Intel® Core™ i7, i5, i3 Mobile Processors (including 2nd, 3rd, 4th, 5th and 6th Generation Intel® Core™ processors)

Intel® Core™2 Extreme Mobile Processor

Intel® Core™2 Quad Mobile Processor

Intel® Core™2 Duo Mobile Processor

Intel® Pentium® Mobile Processor

Desktop Processors

Intel® Atom™ Processor

Intel® Core™ i7 Desktop Processor Extreme Edition (including 2nd, 3rd, 4th and 5th Generation Intel® Core™ processors)

Intel® Core™ i7, i5, i3 Desktop Processors (including 2nd, 3rd, 4th, 5th and 6th Generation Intel® Core™ processors)

Intel® Core™2 Quad Desktop Processor

Intel® Core™2 Extreme Desktop Processor

Intel® Core™2 Duo Desktop Processor

Server and Workstation Processors

Intel® Xeon® processors E7 family (including v2 and v3)

Intel® Xeon® processor E5 family (including v2 and v3)

Intel® Xeon® processors E3 family (including v2, v3 and v4)

Intel® Xeon® Processor D family

Intel® Xeon® Processor 7000 Sequence

Intel® Xeon® Processor 6000 Sequence

Intel® Xeon® Processor 5000 Sequence
Intel® Xeon® Processor 3000 Sequence
Intel® Xeon Phi™ Coprocessors
Quad-Core Intel® Xeon® processors 7xxx, 5xxx, and 3xxx series
Dual-Core Intel® Xeon® processors 7xxx, 5xxx, and 3xxx series

System Memory Requirements

- At least 2 GB of RAM

Disk Space Requirements

- About 700 MB free disk space required for all product features and all architectures

Software Requirements

- Supported operational systems (embedded editions not supported):
 - Microsoft* Windows* 7 and SP1
 - Microsoft* Windows* Server 2008
 - Microsoft Windows* 8 and 8.1 (including Windows Store applications [1])
 - Microsoft* Windows Server 2012*
 - Microsoft Windows* 10
- Supported compilers:
 - Intel® C/C++ Compiler 11 and higher
 - Intel® Fortran Compiler 11 and higher
 - Intel® Parallel Composer
 - Microsoft* Visual Studio* C/C++ Compiler
 - Cygwin (tested Cygwin 1.7.17 with GCC 4.5.3)
 - MinGW (tested MinGW with GCC 4.6.2)
- Supported Microsoft Visual Studio versions:
 - Microsoft* Visual Studio* 2012
 - Microsoft* Visual Studio* 2013
 - Microsoft* Visual Studio* 2015 (including Update 2)
- Application coding requirements
 - Supported programming languages:
 - Fortran
 - C
 - C++
 - C# [2]
 - Java*
 - OpenCL*
 - Concurrency and Locks and Waits analysis types interpret the use of constructs from the following threading methodologies:
 - Intel® Threading Building Blocks
 - Win32* Threads on Windows*

- OpenMP* [3]
 - Intel's C/C++ Parallel Language Extensions
- Supported Java* environments:
 - Oracle* JVM 6, 7 and 8 – Hotspots and Hardware event-based analysis types
 - IBM* J9 – Hardware event-based analysis types only
- Supported OpenCL* environments:
 - Intel® SDK for OpenCL Applications 2013 for Windows* Oss
- Supported Intel® Manycore Platform Software Stack (Intel® MPSS) versions for Intel® Xeon Phi™ co-processor profiling:
 - Hardware event-based sampling analysis: the MPSS 2.1, 3.0 and higher up to 3.6
 - Hardware event-based sampling analysis with stacks is not available for Windows* host.
- To view PDF documents, use a PDF reader, such as Adobe Reader*.

Notes:

1. VTune Amplifier XE supports analysis of Windows Store applications on Microsoft Windows 8* via the Attach to Process or Profile System modes. Launch Application mode is not supported. Supported analysis types are Basic Hotspots and hardware event-based sampling analysis, including stack collection. Concurrency and Locks and Waits analysis types are not supported.

2. VTune Amplifier fully supports .NET* versions 3.5 and below. There are limitations for .NET 4.0 and higher: analysis types “Locks and Waits” and “Concurrency” can’t detect synchronization primitives from Task Parallel Library classes and algorithms in the System.Threading.Tasks namespace. For more details about .NET profiling, refer to [this article](#).

3. VTune Amplifier XE supports analysis of applications built with Intel® Fortran Compiler Professional Edition version 11.0 or higher, Intel® C++ Compiler Professional Edition version 11.0 or higher, GNU* C/C++ Compiler 4.2 or higher, or Microsoft* Visual Studio* C/C++ Compiler.

4 Technical Support

If you did not register your product 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.

For information about how to find Technical Support, Product Updates, User Forums, FAQs, tips and tricks, and other support information, please visit <http://www.intel.com/software/products/support/>

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

5 Installation Notes

Please refer to the “Install guide” document that is also available online:

<https://software.intel.com/en-us/Intel-VTune-Amplifier-XE-Install-Guide-Windows>

6 Issues and Limitations

Known Installation and Configuration Issues

- By default, Microsoft Visual Studio* 2012 sets the **Launch in Help Browser** option to display documentation for integrated products. To view the VTune Amplifier XE (local) help documentation: Choose **Help > > Intel VTune Amplifier XE > Intel VTune Amplifier XE Help** (or use context-sensitive help). If you still encounter problems viewing the help, Choose **Help > Set Help Preferences > Launch in Help Viewer**.

Profiling .NET and Windows Store* applications

For full list of requirements, limitations and tips about profiling .NET and Windows Store applications using VTune™ Amplifier, refer to [this article](#).

- **Running time is attributed to the next instruction** (200108041)
 - To collect the data about time-consuming running regions of the target, the VTune™ Amplifier XE interrupts executing target threads and attributes the time to the context IP address.
 - Due to the collection mechanism, the captured IP address points to an instruction AFTER the one that is actually consuming most of the time. This leads to the running time being attributed to the next instruction (or, rarely to one of the subsequent instructions) in the Assembly view. In rare cases, this can also lead to wrong attribution of running time in the source - the time may be erroneously attributed to the source line AFTER the actual hot line.
 - In case the inline mode is ON and the program has small functions inlined at the hotspots, this can cause the running time to be attributed to a wrong function since the next instruction can belong to a different function in tightly inlined code.
- **Thread stack size limitation** (200108571)

- The VTune™ Amplifier XE may crash with the following error message: Error: failed to create a sampling thread: not enough storage is available to process this command. This happens when the profiled application has big reserved and committed thread stack size (/STACK:reserve[,commit] command line switch of link.exe). The suggested workaround is reducing the reserved/committed thread stack size to profile the target.
- **Results not collected for processes terminated with TerminateProcess()** (200108689)
 - No results are displayed for any process being profiled that is terminated by a different process calling TerminateProcess(). Instead, a different method should be used to terminate the process.
- **Incorrect timing results when running on a 32-bit virtual machine** (200137061)
 - VTune Amplifier XE may fail to collect correct timing data when running on a virtual machine with problematic virtualization of time stamp counters. In this case the VTune Amplifier XE throws a warning message:
 - “Warning: Cannot load data file '<path_to_a_trace_file>.trace' (syncAcquiredHandler: timestamps aren't ascended!)”
- **An application that allocates massive chunks of memory may fail to work under VTune Amplifier XE** (200083850)
 - If a 32-bit application allocates massive chunks of memory (close to 2 GB) in the heap, it may fail to launch under the VTune Amplifier XE while running fine on its own. This happens because the VTune Amplifier XE requires additional memory when profiling an application. The workaround could be in using larger address space (for example, converting the project to 64-bit).
- **.NET modules loaded dynamically via Reflection API are displayed as "unknown" hotspots** (200088121)
 - If dynamic .NET modules (e.g. loaded via Assembly.LoadFrom) are used in target application, VTune Amplifier will show them as "unknown" functions and modules in hotspots list.
- **Hardware event-based analysis may crash certain Intel® Core™ i7 processor-based systems when deep sleep states are enabled** (200149603)

- On some Intel® Core™ i7 processor-based (code named Nehalem) systems with C-states enabled, sampling may cause system hanging due to a known hardware issue (see errata AAJ134 in <http://download.intel.com/design/processor/specupdt/320836.pdf>). To avoid this, disable the “Cn(ACPI Cn) report to OS” BIOS option before sampling with the VTune Amplifier XE analyzer on Intel Core i7 processor-based systems.
- **Link to instruction guide: instruction set reference document is not positioned on description of proper instruction.** (200091200)
 - The reference information for assembly instructions can be opened in any PDF viewer, but only Adobe Acrobat Reader* supports positioning the instruction reference document on the required page. To ensure correct functionality of this feature, you are recommended to install the latest available version of Adobe Acrobat Reader.
- **Uninstalling limitation: pin.exe stays running after detaching.** (200092295)
 - The VTune™ Amplifier XE cannot be uninstalled after attaching to the target to be profiled until running the target is over. The cause is that pin.exe keeps working after detaching from the target and exits only after the profiled application/process execution finishes.
- **VTune™ Amplifier XE does not support profiling an application launched under debugger** (200092508)
 - The Hotspot, Concurrency or Lock and Waits analysis types provide incorrect results when analyzing an application launched under a debugger. VTune Amplifier XE does not detect whether a debugger is attached to a profiled application. Make sure that no debugging tools are attached to the application that is profiled with the VTune Amplifier XE.
- **Second attach to the same application should print an error and exit immediately.** (200092650)
 - The VTune™ Amplifier XE allows running the analysis while the previous one is in progress but does not store any data for the second analysis run.
- **Intel® Compiler only produces first level of inlines. The nested inlines are not emitted into the debug information.** (200164310)
 - Intel® Compiler currently generates debug information only for the first level of inline functions. So, you cannot see performance data attributed to functions inlined to other

inline functions. Instead, this performance data are attributed to corresponding functions inlined to regular (not inline) functions. This may also cause wrong source line attribution of performance data in the source view.

- **Timeline pane displays incorrect concurrency and thread states for a paused region in the Concurrency and Locks and Waits analyses.** (200204715)
 - Concurrency and thread state data may be incorrect in the Timeline pane for a region corresponding to the time when data collection was paused. Ignore the timeline data in a paused region during result analysis.

- **Java source line may be shown incorrectly for Oracle JDK 6u25 x64** (200167001)
 - Drilling down to Java source code from VTune Amplifier XE results may show incorrect source line. The issue occurs with Java applications built with Oracle JDK 6u25 x64. This is the JDK problem, refer to issues JDK-7051767 and JDK-7047624 in Oracle bug database.

- **Result finalization may be slow if results are located in a remote network directory** (200169322)
 - The problem is caused by slow network access. To improve performance use local directory for result storage.

- **Additional setup is needed to use ITT API in attach to process mode** (200172007)
 - To enable user API in attach mode, set the following environment variables before starting target application:
 - INTEL_LIBITNOTIFY32=<install_dir>\bin32\runtime\ittnotify_collector.dll
 - INTEL_LIBITNOTIFY64=<install_dir>\bin64\runtime\ittnotify_collector.dll
 - Note: the variables should contain the full path to the library without quotes

- **Only one stack frame is shown in Java code if IBM* J9* JVM is used** (200227950)
 - Currently Java stack unwinding is not supported for IBM* J9* JVM.

- **VTune Amplifier XE can show [unknown stack frame(s)] as a hotspot in EBS analyses in Windows* 2008 R2** (200173627)
 - Workaround is to start VTune Amplifier XE under the explicit “Run as administrator” option, even if current user has administrator credentials.

- **Attachment as Administrator to a process that launched by the 'System' user fails** (200259643)
 - You may use a utility from <http://technet.microsoft.com/en-us/sysinternals/bb897553> to profile a system service (e.g. w3wp.exe-based code) from the command line using amplxe-cl.exe that is located in <product_install_dir>/bin32. Do the following:
 - 1. Configure the w3wp service to run with the permissions you use to log in: Open IIS Manager, right-click an application pool you are using and set “Process model:Identity” to the account under which w3wp needs to be run.
 - 2. Run the w3wp service and make sure you run it with proper credentials and remember its PID.
 - 3. Start data collection:
 - psexec -i 0 /path/to/amplxe-cl.exe -c=hotspots -r /path/for/your/data_dir --target-pid=PID
 - 4. Run your workload.
 - 5. Stop data collection:
 - psexec -i 0 /path/to/amplxe-cl.exe -command detach -r /path/for/your/data_dir
 - 6. Open /path/for/your/data_dir in GUI:
 - <product_install_dir>/bin32/amplxe-gui /path/to/your/data_dir
- **Do not use -ipo option with Intel® compiler version earlier than 13.0.** (200260765)
 - If using the Intel® compiler version earlier than 13.0, to get performance data on inline functions, use the additional option “/debug:inline-debug-info”, but avoid using the /Qipo option. Currently this option disables generating the inline debug information in the compiler. Note that the Intel compiler integrated into the Microsoft Visual Studio* IDE uses the /Qipo by default in the Release configuration.
- **Intel® Compiler 13.0 and earlier doesn't support function split ranges in debug info which may lead to wrong performance data attribution in case function ranges are overlapped (e.g. performance data attributed to one function, but should have been split by two).** (200260768)
 - In some cases the Intel® Compiler 13.0 and earlier generates imprecise debug information about ranges of inline functions. This may lead to wrong performance data attribution when the Inline mode is turned on, for example: instead of two functions performance data is attributed just to one of them.
- **Call stack can't be unwound via no return functions** (200263851)

- If analyzed application contains functions without ret instruction, e.g. calling exit(), unwinding call stack to its caller and higher may fail (no stack frames shown).
- **Attaching the VTune Amplifier XE to a process may take some time** (200276420)
 - Your target application may complete before the data collection starts, so the VTune Amplifier XE may report an error. Increase the duration of your test application if necessary.
- **Command "status" is not supported for hardware event-based analysis types** (200281661)
 - Command line option "\$ amplxe-cl -command status" is currently supported only for user mode sampling and tracing based analysis types, but not for EBS analysis types.
- **Hardware event-based analysis may cause unpredictable system behavior on processors based on Intel® microarchitecture code named Sandy Bridge** (200285401)
 - On processors based on Intel microarchitecture code named Sandy Bridge, hardware event-based sampling may cause unpredictable system behavior due to a known hardware issue (see erratum BK105 in <http://www.intel.com/content/dam/www/public/us/en/documents/specification-updates/2nd-gen-core-family-mobile-specification-update.pdf>). To avoid this, you are not recommended to run General Exploration, Client Analysis, Cycles and Uops, Loop Analysis or Custom Hardware event-based analysis with precise events on these systems unless a BIOS workaround for the erratum is provided.
- **Installing VTSS++ driver on the system where SEP and VTSS++ drivers have been already registered may fail** (200292274)
 - Running the following command may cause an error:
 - >amplxe-sepreg.exe -i
 - Installing and starting sepdrv3_8...OK
 - Installing and starting sepdal...OK
 - Installing and starting VTSS++ driver...FAILED
 - This can happen due to insufficiency of available memory. Rebooting the system helps to get resources cleaned so registration after reboot should work.

- **Hardware event-based analysis doesn't work if more than 128 events are gathered simultaneously** (200293868)
 - Decrease number of PMU events in analysis settings to resolve it.
- **Results should be closed before comparing them** (200236090)
 - VTune Amplifier XE doesn't support opening same result twice. Due to that limitation it is not possible to compare (via "Compare" button) results if one of them is already opened. You should close results first then compare them.
- **Limited support of Windows Store* applications** (200299329)
 - VTune Amplifier XE supports attaching to Windows Store* applications, but not launching them. Only hardware event-based analysis types are supported.
- **Microsoft* Visual Studio* 2012 help may be displayed incorrectly** (200300692)
 - On Microsoft* Windows Server 2012* systems, if you have problems viewing Microsoft* Visual Studio* 2012 help, 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.
- **VTune Amplifier XE analysis may fail on machine with Verdasys Digital Guardian* software installed.** (200237470)
 - User mode sampling and tracing based analysis types (Hotspots, Concurrency, Locks and Waits) run from GUI may fail if Verdasys Digital Guardian* software is installed on the machine. However it is still possible to run collection from command line.
 - Alternatively EBS collection with stacks can be used, either from GUI or command line.
- **Analyzed application may crash during analysis if "Symantec Endpoint Protection Application and Device Control" software is installed** (200237601)
 - The issue may occur with user mode sampling and tracing based analysis types (Hotspots, Concurrency, and Locks and Waits). Ways to overcome the problem:
 - 1. If user mode sampling and tracing based analysis is needed exclude the analyzed application from the list of monitored applications of "Symantec Endpoint Protection Application and Device Control" software.
 - 2. Use "Lightweight hotspots" with "Collect stacks" option turned on instead.

- **ITT API task or frame is not shown in results if its end occurs when collector is inactive** (200331811)
 - When ITT task or frame end notification occurs after collection was paused, or detach or stop command issued, the frame or task is not displayed in the result.
- **Documentation can't be opened in Microsoft Internet Explorer* 10 on Windows Server* 2012** (200340007)
 - To correct the problem modify security settings in Microsoft Internet Explorer* 10. From Tools > Internet Options > Security, add "about:internet" to the list of trusted sites.
- **Child process analysis doesn't work for EBS analysis types if process is run from script using "start" command** (200342928)
 - If a process is started from a batch file by "start" command, it doesn't have original command interpreter as a parent process. So the new process can't be identified as a child and not profiled. This is true for all Hardware event-based analyses. Possible workarounds:
 - - Use user mode sampling and tracing based analysis types instead
 - - Use "call" command in a batch file instead of "start"
 - - Use "attach to process" collection mode to connect directly to the process of interest
- **Collection of some GPU analysis metrics should be enabled in BIOS for 3rd Generation Intel® Core™ processors** (200342983)
 - Some systems disable collection of extended metrics such as L3 misses, memory accesses, sampler busyness, SLM accesses, etc. in the BIOS. On some systems, but not all, they can be enabled by changing a bios option. The presence or absence of the option and its name are BIOS vendor specific. Look for something like an "Intel(R) Graphics Performance Analyzers" option in your BIOS and set it to "Enabled ". Note that this option is BIOS vendor specific, may not always be present and may be named differently. Check the BIOS options on your system for details.
- **VTune Amplifier doesn't resolve symbols for .NET applications using NGEN** (200248497)
 - Symbol resolution is not supported for .NET applications built using Native Image Generator (NGEN) if results are collected using Event Based Sampling analysis types.

You can find details how to resolve it in “Windows Store Applications Analysis” topic of VTune help document.

- **An application may experience the stack overflow exception when running under the VTune Amplifier (200249394)**
 - An application allocating massive chunks of memory on a thread stack may experience the stack overflow exception and fail when running under the VTune Amplifier, while running flawlessly on its own. This happens because the VTune Amplifier requires additional space on an application thread stack for profiling needs. To work around this problem, consider using larger thread stack space.
- **Results may contain process name cut on the 14th character (200401361)**
 - VTune may cut long process name on the 14th character in results collected with EBS analysis types with stacks. E.g. the result should contain "find_hotspots.exe", but it contains only "find_hotspots.". This is operating system limitation.
- **Warning "Unsigned driver" during installation for sepdrv and vtss drivers on Windows* 7 and Windows* Server 2008 R2 (200574645)**
 - VTune Amplifier hardware event-based sampling drivers (sepdrv.sys and vtss.sys) are signed with digital SHA-2 certificate key for compliance with Windows 10 requirements.
 - To install the drivers on Windows* 7 and Windows* Server 2008 R2 operating systems, add functionality for the SHA-2 hashing algorithm to the systems by applying Microsoft Security update 3033929: <https://technet.microsoft.com/en-us/library/security/3033929>

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5. Time Zone Database
 ICU uses the public domain data and code derived from Time Zone
 Database for its time zone support. The ownership of the TZ

database is explained in BCP 175: Procedure for Maintaining the Time Zone Database section 7.

7. Database Ownership

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svg-pan-zoom

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node-xml2js

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