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

Installation Guide and Release Notes 7 August 2015

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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 (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
    - Support for a collection of system-wide context switches that enables an analysis of detailed scheduling layout for all threads on the system and identifies the nature of context switches for a thread (preemption or synchronization)
    - 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
- Support for Fedora* 22, Debian* 8, Ubuntu* 15.04, Red Hat* Enterprise Linux 7

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 available in the following environments virtualizing the on-chip Performance Monitoring Unit (PMU):
        - VMware Fusion* 5 and higher
        - KVM with Linux Kernel 3.2 and QEMU 1.4
        - XEN 4.0 and higher for User Domain (domU)

      Event-Based Sampling and Sampling with stacks data collection is functional inside a Virtual machine only for architectural events.

      Please see the Performance Monitoring Unit Sharing Guide at http://software.intel.com/file/30388/ for more details on the supported architectural events.

      VTune Amplifier installation detects virtual environment and disable sampling drivers installation to avoid system instability.

Hardware Event-based Sampling (EBS) analysis run a driverless sampling collection via Linux Perf* tool.

- 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 and 5th 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 and 4th 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

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

Software Requirements

- Supported Linux distributions:
  - Red Hat* Enterprise Linux 5, 6 and 7 [1]
  - CentOS* versions equivalent to Red Hat* Enterprise Linux* versions listed above
  - SUSE* Linux* Enterprise Server (SLES) 11 and 12
  - Fedora* 21 and 22
  - Ubuntu* 12.04, 14.04 and 15.04
  - Debian* 7.0 and 8.0
- Supported compilers:
  - Intel® C/C++ Compiler 11 and higher
  - Intel® Fortran Compiler 11 and higher
  - GNU C/C++ Compiler 3.4.6 and higher

- Application coding requirements
  - Supported programming languages:
    - Fortran
    - C
    - C++
    - Java*
    - OpenCL*
  - Concurrency and Locks and Waits analysis types interpret the use of constructs from the following threading methodologies:
    - Intel® Threading Building Blocks
    - Posix* Threads on Linux*
    - OpenMP* [2]
    - 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 XE 2013

- Hardware event-based sampling analysis with stacks requirements
  - Linux kernel version 2.6.32 or above

- Driverless hardware event-based sampling analysis:
  - Linux kernel version 2.6.32 or above, exporting CPU PMU programming details over /sys/bus/event_source/devices/cpu/format file system

- 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, 3.3.*, 3.4.* and 3.5.*
    - Hardware event-based sampling analysis with stacks: the MPSS 3.3, 3.3.2, 3.3.3, 3.3.4, 3.3.5, 3.4, 3.4.1, 3.4.2, 3.4.3, 3.4.4, 3.5, 3.5.1, 3.5.2

- To view PDF documents, use a PDF reader, such as Adobe Reader*.
- To enable automatic product updates with the Intel Software Update Manager, use Java* version 1.6 or higher.

Notes:
1. **Red Hat Enterprise Linux 5* is deprecated**. Support for this operating system version is deprecated and may be removed in a future release.

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

3. **32-bit graphical host deprecated**. The 32-bit VTune Amplifier graphical host is deprecated and may be removed in a future release. Thus, in the future release, a 64-bit OS host will be required to graphically analyze collected profile data. Command line profiling and reporting on 32-bit OS hosts will still be supported.

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-Linux

6 Issues and Limitations

Known Issues and Limitations

- **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.

- **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).

- **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 inhttp://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.

- **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.

- **Security-enhanced Linux* is not supported** (200155374)
  - Security-enhanced Linux settings (SELinux) are currently not supported by the VTune Amplifier XE and need to be either disabled or set to permissive for a successful tool suite installation. If your Linux distribution has SELinux enabled the following error message will be issued by the installer: "Your system is protected with Security-enhanced Linux (SELinux). We currently support only "Permissive" mode, which is not found on the system. To rectify this issue, you may either disable SELinux by - setting the line "SELINUX=disabled" in your /etc/sysconfig/selinux file - adding "selinux=0" kernel argument in lilo.conf or grub.conf files or make SELinux mode adjustment by - setting the line "SELINUX=permissive" in your /etc/sysconfig/selinux file or ask your system administrator to make SELinux mode adjustment. You may need to reboot your system after changing the system parameters. More information about SELinux can be found at http://www.nsa.gov/selinux/"

- **VTune Amplifier XE user mode collection may fail to run on Ubuntu** (200197563)
  - VTune Amplifier XE may fail to collect data for Hotspots, Concurrency, and Locks and Waits analysis types on the Ubuntu operating system. Once a collection is started, the message appears in the output: "Failed to start profiling because the scope of ptrace() system call application is limited. To enable profiling, please set /proc/sys/kernel/yama/ptrace_scope to 0. See the Release Notes for instructions on enabling it permanently."

- To workaround this problem for the current session, set contents of the /proc/sys/kernel/yama/ptrace_scope sysctl file to 0.
- To make this change permanent, set kernel.yama.ptrace_scope value to 0 at /etc/sysctl.d/10-ptrace.conf file using root permissions and reboot the machine.

- **Concurrency analysis may provide incorrect Wait time data if Linux futexes are used** (200163557)
  - In certain cases, custom synchronization constructions based on Linux futexes are not detected by the VTune Amplifier XE. System libraries may also use such constructions. To ensure Wait time correctness in the Concurrency analysis, use syscall(SYS_futex, ...) API in your code.

- **VTune Amplifier XE collectors may crash or produce corrupted data while profiling stripped binaries.** (200165647)
  - VTune Amplifier XE may fail to collect data for Hotspots, Concurrency, and Locks and Waits analysis types if the main executable of an analysis target statically links some symbols from libc.so or libpthread.so (for example, pthread_create). To avoid this, do not strip the main executable. Use the -E linker switch to export the statically linked symbols to the dynamic symbol table of the main executable. For the list of symbols required for correct profiling, see the Analyzing Statically Linked Libraries topic in the online help.

- **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.

- **Running other PMU-based tools simultaneously with hardware event-based sampling collection is not supported** (200166101)
  - The Sampling Driver requires exclusive use of the PMU resources. Running multiple PMU based tools will cause incorrect results and/or system instability.

- **Hotspots, Concurrency and Locks and Waits analysis types may not work on executables that do not depend on the libpthread.so.0 library.** (200208975)

- There is currently a limitation in the product regarding profiling application targets where the executable does not depend on the libpthread.so.0 library. The message "Link libpthread.so to the application statically and restart profiling" appears when profiling an application where program image does not depend on libpthread.so.0 but then it dlopen()-s a shared library which does depend on libpthread.so.0. The collector is not able to follow the program execution and module load/unload so the collection results are likely to be misleading. A workaround is to set "LD_PRELOAD=libpthread.so.0" before running the collection.

- **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.

- **Opening results significantly delayed on Linux systems configured with "large pages"** (200215471)
  - To work around this issue make sure that you have hugectl utility and libhugetlbfs library on the system. VTune Amplifier XE can be started this way:
  - hugectrl --heap <amplxe install dir>/bin32/amplxe-gui
  - LD_PRELOAD=libhugetlbfs.so <amplxe install dir>/bin64/amplxe-gui

- **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_LIBITTNOTIFY32=<install_dir>/lib32/runtime/libittnotify_collector.so
  - INTEL_LIBITTNOTIFY64=<install_dir>/lib64/runtime/libittnotify_collector.so
  - 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.

- **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 “-inline-debug-info”, but avoid using the –ipo option. Currently this option disables generating the inline debug information in the compiler.

- **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).

- **Help TOC is truncated in some Linux browsers.** (200272063)
  - When using certain HTML browsers to view the VTune Amplifier XE documentation, if the Contents tab width appears truncated and hides some of the topic titles:
  - - Click the Index (or Search) button
  - - Click the Contents button

- **VTune™ Amplifier XE data collection on Intel® Xeon Phi™ coprocessor (codename: Knights Corner) currently is limited to hardware event-based sampling data collected from target units** (200179057)
  - No information on function call stacks is recorded during collection. However, you may mistake partial call chains appearing in result Groups for real call stack information. These partial chains are the result of inline function information in debug symbol tables and can be ignored.

- **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.

- **VTune Amplifier XE user APIs are not supported for static binaries** (200279211)

- To use ITT and JIT APIs with software based collectors (Hotspots, Concurrency, Locks and Waits) user needs to link their application dynamically. Otherwise ITT and JIT API notifications will be missing in the result.

- **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.

- **Limited event description for Intel® Xeon® processor E5-XXXX and the 2nd Generation Intel® Core™ processor family desktop processors.** (200285238)
  - Developers can find more details on events by checking the Intel® 64 and IA-32Architectures Software Developer's Manualhttp://download.intel.com/products/processor/manual/325462.pdf, Tables 19-3, 19-4 and 19-5.

- **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.

- **Hot functions are duplicated in the grid if inline mode is ON. When turning it off, only one entry remains but the stack for it is not resolved.** (200287043)
  - Change stack unwinding mode to "After collection". For doing this create a new custom analysis and select 'After collection' in 'Stack unwinding mode' drop-down list.

- **Intel(R) VTune(TM) Amplifier XE may detect which timer source to use incorrectly on Intel® Xeon® processor E5-XXXX processors.** (200287361)

- In User mode Samplign and Tracing based analysis (Hotspots, Concurrency, Locks and Waits) the following message may be displayed in command line or Debug Window:
- Warning: Cannot load data file `C:\art\tmp\1\r003hs\data.0\18385-18389.0.trace' (SampleCallback: timestamps aren't ascended!).
- To work around the problem collect results from command line using "-run-pass-thru" option:
- amplxe-cl -collect hotspots -run-pass-thru=-timestamp=sys -- <application>

- **List of hotspots may contain "Outside any known module" on systems with kernel older than 2.6.20** (200233501)
  - Results of user mode sampling and tracing based analysis types may contain "Outside any known module" region. Those samples may actually come from vsyscall module. This is kernel problem that fixed in later versions.

- **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.

- **When installing on a Xen* virtual machine, it may happen that installation script exits claiming CPU is unsupported.** (200294340)
  - To skip the check for CPU model, add --ignore-cpu parameter to install script command line:
  - ./install.sh --ignore-cpu

- **User-mode sampling and tracing collection may cause an error when profiling COI/SCIF application on Intel(R) Xeon Phi(TM) processor** (200234639)
  - If you get a COI buffer error with User-mode sampling and tracing collection, use hardware event-based analysis instead.

- **Decreasing sampling interval for user-mode sampling and tracing collection may lead to wrong CPU usage data** (200296537)
  - TPSS sampling technology is based on OS timers which cannot tick faster than HZ value configured during kernel compilation. Sampling interval should not be less than HZ value.

- **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.

- **User tasks, events and frames marked with ITT APIs may not be shown if target application is finished by Ctrl+C** (200304207)
  - Use another method to stop application, or VTune Amplifier XE "stop" command.

- **Functions from kernel modules do not appear in the collection results** (200311949)
  - Hardware event-based analysis results may not contain functions from kernel modules if kernel pointers were explicitly hidden by setting the "kptr_restrict" sysctl to non-zero value. As a result you may see CPU time associated with the [Outside any known module] item.
  - To workaround this problem for the current session, set contents of the /proc/sys/kernel/kptr_restrict sysctl file to 0 before starting VTune Amplifier.

- **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.

- **VTune Amplifier XE may report less data than expected on Intel Xeon Phi coprocessor due to power management settings** (200343917)
  - VTune Amplifier XE may show less data than expected when profiling an Intel Xeon Phi application. E.g. results may contain data collected only on a few CPUs, data collected only on a short period of time, etc. This issue does not occur on Intel® Xeon Phi™ Coprocessor 5110P. The problem is caused by interoperability with system power management.
  - As a workaround you can disable power management for the Xeon Phi card:
  - 1. In configuration file /etc/mpss/mic0.conf if exists, otherwise in /etc/sysconfig/mic/mic0.conf:
  - change: PowerManagement "cpufreq_on;corec6_on;pc3_on;pc6_on"
  - to: PowerManagement "cpufreq_on;corec6_off;pc3_off;pc6_off".
  - 2. Issue the following commands:
  - sudo service micras stop

- sudo service mpss unload
- sudo micctrl --resetconfig
- sudo service mpss start
- 3. Start VTune Amplifier XE profiling again.

- **VTune Amplifier may cause KVM guest virtual machine to crash** (200384245)
  - In some cases, when you run Event Based Sampling analysis on a host machine, a guest KVM virtual machine may experience kernel panic. This happens only if precise events are used, e.g. with General Exploration analysis type. Upgrade KVM to a newer version, there is a KVM patch that fixes the problem.

- **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.

- **Linux systems with real time kernel versions are not fully supported** (200524374)
  - Event Based Sampling analysis with stacks and user mode sampling and tracing based analysis types are not supported on systems with real time kernel. Event Based Sampling analysis without stacks are supported if real time kernel is run on a supported Linux distribution.

- **VTune Amplifier GUI may not have scroll bars on Ubuntu OS** (200534347)
  - On the Ubuntu 12.04 and newer with the overlay scrollbars style there maybe be no scrollbars available in the VTune Amplifier GUI. To get them shown - change scrollabar style by invoking the command below before running amplxe-gui:
  - On the Ubuntu 12.x:
  - gsettings set org.gnome.desktop.interface ubuntu-overlay-scrollbars false
  - On the Ubuntu 13.x and newer:
  - gsettings set com.canonical.desktop.interface scrollbar-mode normal

- **Spin Time metric is not available for Locks and Waits results grouped by synchronization objects** (200540951)
    - Due to a temporary product limitation, the Spin Time metric data is not provided for synchronization objects in the Locks and Waits viewpoint. The Spin Time metric is available for other grouping levels in the Hotspots by CPU Usage or Hotspots by Thread Concurrency viewpoints.

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*/
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```
pci.ids

#
#   List of PCI ID's
#
#   Version: 2014.11.23
#   Date:    2014-11-23 03:15:02
#
#   Maintained by Martin Mares <mj@ucw.cz> and other volunteers from the
#   PCI ID Project at http://pci-ids.ucw.cz/.
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