CodeXL 2.5 GA Release Notes

Contents

Thank you for using CodeXL. We appreciate any feedback you have! Please use the CodeXL Issues Page to provide your feedback.

You can also check out the Getting Started guide and the latest CodeXL blog at GPUOpen.com

This version contains:

- For 64-bit Windows® platforms
  - CodeXL Standalone application
  - CodeXL Microsoft® Visual Studio® 2010 extension
  - CodeXL Microsoft® Visual Studio® 2012 extension
  - CodeXL Microsoft® Visual Studio® 2013 extension
  - CodeXL Microsoft® Visual Studio® 2015 extension
  - CodeXL Remote Agent
- For 64-bit Linux® platforms
  - CodeXL Standalone application
  - CodeXL Remote Agent

New in this version

CodeXL v2.5 adds the following major features on top of the CodeXL v2.4 feature set:

- Updated version of Radeon Compute Profiler (5.2). See the Radeon Compute Profiler's Release Notes for details.
- GPU Profiling:
    - Improved display of HSA Agent names in the Application Timeline.

System Requirements

CodeXL contains a host of development features with varying system requirements:

- **Frame Analysis**
    - The latest Radeon™ Software version (see "Getting the latest Radeon™ Software release" section below).
- **GPU Profiling and OpenCL™ Kernel Debugging**
    - An AMD GPU (Radeon HD 7700 series or newer, desktop or mobile version) or APU is required.
    - Radeon Software Crimson ReLive Edition 17.9.1 (driver 17.30) is the recommended driver on Windows®, and the latest amdgpu-pro (driver 17.30) on Linux®.
    - Earlier HW configurations (Radeon HD 5000/6000 series) are no longer supported by Radeon Software Crimson Edition and CodeXL 2.0. For these configurations please install CodeXL 1.9 (available here) and the AMD Catalyst driver release 13.11 or later. Catalyst 15.9.1 (driver 15.201) is the recommended version.
    - OpenCL™ kernel debugging requires the closed-source AMD OpenCL™ compiler.
- **ROCm/HSA Profiling**
    - Supported on the ROCm stack, version 1.6. See the below link for supported hardware configurations:
        - https://rocm.github.io/hardware.html
    - Follow the installation instructions at the following link to install ROCm:
        - https://rocm.github.io/install.html
    - Should a new version of the ROCm become available, the version of the profiler included in CodeXL may need to be updated in order to be compatible with that version. If/when a new runtime is published to GitHub, we will also publish new HSA Profiler binaries on GitHub (https://github.com/GPUOpen-Tools/RCP). There will be instructions included in the aforementioned repository describing what steps may need to be taken to use a new profiler build with an existing CodeXL build.
- For **GPU API-Level Debugging**, a working OpenCL™/OpenGL® configuration is required (AMD or other).
- **CPU Profiling**
    - Time-Based Profiling can be performed on any x86 or AMD64 (x86-64) CPU/APU.
    - The Event-Based Profiling (EBP) and Instruction-Based Sampling (IBS) session types require an AMD CPU or APU processor.

- CPU Profiling on Linux® platforms - Limitations of PERF
  - CPU profiling uses PERF which requires kernel 2.6.32 or later. CPU Profiling with Call Stack Sampling requires Linux® kernel 3.0 or later. However, we recommend using kernel 3.2 and above which has shown to be more stable.
  - Call chain analysis on Linux® currently depends on the call chain information provided by Linux® PERF. This requires the profiled binaries to have stack frame pointer. (i.e., compiled with -fno-omit-frame-pointer).
  - For non-root users to run CodeXL CPU profiling, "/proc/sys/kernel/perf_event_paranoid" needs to be set to "-1".
  - Instruction-Based Profiling on Linux® requires Linux® kernel 3.5 and above.
  - Call chain information (stack trace) for inline functions is not available.

- **CPU Profiling on VMWare**
  - Time-Based Profiling (TBP) and Event-Based Profiling (EBP) are supported in guest OS running on VMware Workstation 11.0 or later.
  - If VMWare Workstation's Virtual Performance Monitoring Counters (VPMC) is not supported on a given CPU, then only time-based profiling will be available. Event-Based Profiling will not capture any data other than CPU cycles.
  - Event-Based Profiling works on Windows® and Linux® guest OS in these scenarios:
    - Host OS: Windows®, Guest OS: Windows® 7, Windows® 8.1, Win10, Ubuntu 14.04, RHEL 7
    - Host OS: Linux®, Guest OS: Window 7, Windows® 8.1, Win10, Ubuntu 14.04, RHEL 7
  - Basic CPU configuration requirements:
    - CPU should support SVM or AMD-V feature. Without this VMware will not be able to do hardware virtualization.
    - This CPU feature can be enabled/disabled from BIOS settings.

- **Power Profiling**
  - Supported on:
    - AMD Ryzen CPU Processor.
    - Carrizo, Kaveri, Mullins and Temash APUs.
    - The majority of the Graphics IP 7 GPUs (code name "Sea Islands") or more recent, including AMD Radeon™ and AMD FirePro™ models.
    - AMD Radeon RX 500 Series.

- **Static Analysis**
  - OpenCL™/DirectX® 11 kernel/shader analysis requires a working AMD OpenCL™/DirectX® 11 configuration
  - OpenGL® shader analysis on Windows® requires Catalyst 15.9. (driver 15.20) or later
  - For Vega support, Radeon Vega Frontier Edition 17.6 (Driver Packaging Version 17.20) or later is required

Supported platforms:

- Windows® platforms
    - Windows® 7 64-bit, 8.1 64-bit and 10 64-bit (including Windows® 10 Anniversary Update).
        - Windows® 7 & 8.1 require to install Microsoft update KB2999226 https://support.microsoft.com/en-us/kb/2999226
    - Note: For the CodeXL Visual Studio 2010/2012/2013/2015 Package, the station must be installed with Visual Studio 2010/2012/2013/2015, respectively. However, the CodeXL Standalone Application does not require Visual Studio to be installed.
- Linux® platforms
    - Red Hat EL 7 64-bit
    - Ubuntu 16.04 64-bit
    - SUSE 11 SP3 64-bit

Getting the latest Radeon™ Software release

Radeon software packages can be found here:
http://support.amd.com/us/gpudownload/Pages/index.aspx

Radeon Vega Frontier Edition 17.6 (Driver Packaging Version 17.20) can be found here:

- Windows 10
- Windows 7
- Linux

Note about installing CodeAnalyst after installing CodeXL for Windows®

AMD CodeAnalyst has reached End-of-Life status and has been replaced by CodeXL. CodeXL installer will refuse to install on a Windows® station where AMD CodeAnalyst is already installed. Nevertheless, if you would like to install CodeAnalyst, do not install it on a Windows® station already installed with CodeXL. Uninstall CodeXL first, and then install CodeAnalyst.

Fixed Issues

The following are the major fixes that were not part of the v2.4 release and are new to this version:

- Fixed Power Profiler support on Ryzen (https://github.com/GPUOpen-Tools/CodeXL/issues/149)
- Fixed issue with empty OpenCL device list in the System Information dialog (4017)
- GPU Profiler: Fixed incorrect Occupancy chart display after sorting the Performance Counter table (4016)
- GPU Profiler: Fixed incorrect multi-HSA-queue display in application timeline (4012)

Known Issues

On Linux® machines that have gfx900 (Vega) or gfx804 (Lexa) GPUs installed, OpenCL™ compilation fails.	
On Linux® machines, Vulkan Rendering Pipeline compilation fails for gfx900 (Vega), due to a compiler crash.	

When opening a project in CodeXL 2.5 that was originally created in CodeXL 2.4 on a system with a Vega GPU, a GPU Performance Counter session may not collect all available performance counters even though the Project Settings UI shows that all counters are selected. The workaround in this case is to manually unselect and re-select a counter in the UI.	
Debugging OpenCL™ kernels that use read-modify-write atomic operations is not supported.	
GPU Debugging on OpenCL™ Static C++ Kernels is not supported.	334415
OpenCL™ 1.2 keyword printf and barriers are not supported during kernel debugging.	
Building kernels with OpenCL™ 1.2 clCreateProgramWithBinaries and clLinkProgram API prevents the display of source code when debugging these kernels.	369171
Performing CPU Profiling with Call-Stack Sampling (CSS) enabled, on systems with discrete graphics card (Radeon HD 5000, 6000 or 7000 series) and Linux® kernel version 3.0 or lower, may result in Linux® kernel panic. This kernel panic does not occur with Linux® kernel version 3.2 onwards.	352399
CPU Profiling is disabled on Windows® 8 and 8.1 if Hyper-V is enabled.	438549
Note that installing Microsoft Windows® Phone 8.0 SDK activates Hyper-V.	
PERF call chains which contain call stacks across modules have shown to be truncated. This results in inaccurate "Deep Samples", "Downstream Samples", and "Call Path" analysis.	
If gDEBugger 6.x is installed on the machine, mouse click doesn't start text fields editing in CodeXL Visual Studio Extension. Workaround: Navigate to the text fields using TAB or uninstall gDEBugger before installing CodeXL.	344811
Menu items are present but not visible after minimization and restore of CodeXL in Ubuntu system using Unity theme. Workaround: Use Unity 2D theme instead of Unity theme.	353082
AMDTTeapot sample may crash while debugging OpenCL™ kernels after multiple step operations (45 or more).	357741
CPU Profiling on Windows® 8 shows two target applications in Profile Overview. The conhost.exe process is an actual executable. This process fixes a fundamental problem in the way previous versions of Windows® handled console windows®, which broke drag & drop in Vista.	
If CodeXL is installed in path that includes non-ASCII Unicode characters, profiling does not work	365118.
GPU Debugger does not display locals when debugging a kernel with extremely large buffers or worksize.	23, 1156
Power Profiling of Tonga and Iceland dGPUs is disabled.	36, 1497
The Call-graph view for CPU Profiling with call stack collection of 32-bit applications may show two separate paths for a function that has a single path.	223
If the profiled station goes into Sleep/Hibernate state during a Power Profiling session, only data collected before hibernation is displayed, and the navigation slider does not respond.	459572, 224
GPU Debugger does not stop at breakpoints inside kernels that take a very long time to execute and cause a driver TDR.	240

Performing 2 GPU Profiling sessions concurrently - Timeline Application Trace and Performance Counters - on a Red Hat Linux® System may cause a system hang after several minutes.	259, 68176
CPU Profiler runs out of memory and closes down while performing post-processing of a system-wide profile session that combines IBS, CLU and Time-based sampling for over 5 minutes.	265
CPU Profiling multiple processes with call stack collection may result in call graph view displaying addresses instead of function names for functions used by more than one process.	289
The GPU Debugger can't step into a kernel if blocks that contain a return statement.	349
Windows® system crash (Blue Screen of Death) is observed, if CPU Profiling using Event-Based-Profiling is run both in guest and host OS or if CPU Profiling using Event-Based-Profiling is run on host OS while the guest OS is launched. This is an issue in the VMWare VMM driver.	907
GPU Profiler does not display any hsa_*_get_info calls in host thread calls list if they are callbacks encompassed by hsa_iterate_agents calls.	980
CPU Profiler time-based profiling on a VM may produce more samples than the session duration and sampling interval suggest.	1125
Power Profiler displays zero values for 'Others' counters in Summary view if only dGPU counters are selected.	1200
GPU Debugger skips the internal loop in APP SDK nBody sample.	1250
In CPU Profiler's Time-Based Profiling, an unexpected low number of samples is collected when running on guest Win10-64 OS.	1277
Step-in operations require over a minute when debugging clFFT sample.	1324
Unable to launch GPU profiler - cannot allocate memory error on starting profiling after running 2 or 3 GPU Profiler timeline trace sessions for 2-3 min.	1347
CodeXL throws segmentation fault while launching on Linux® through SSH.	1533
The HSAIL Debugger's Debugged Process Events viewer shows SIGPIPE or SIGBUS error while debugging HSAIL Applications.	1590
Multiwatch view is disabled while debugging HSAIL.	1628
API/Draw/Frame steps should be disabled while doing HSAIL debugging.	1648
Newly registered Windows® Store Apps do not appear in the Project Settings list of apps.	1688
CPU Profiler doesn't launch Windows® Store App that is specified in project settings.	1689
System Information dialog's OpenCL™ Devices tab appears empty on Linux®.	1954
GPU debugger backend crashes when we close the Teapot window on I+A system.	2201
In Visual Studio Host+GPU debug session, execution of the debugged application resumes and doesn't break when performing a 'step out' operation.	2412
For some debugged applications, the HSA Debugger breakpoints are not hit.	2516
Frame Analysis runs out of memory when loading and displaying ~40 captured frame traces at once.	2561

In Visual Studio, after using Frame Analysis to capture frame traces, clicking a frame thumbnail without stopping the session may lead to "Session Aborted" error pop up followed by "Failed to load frame data" error.	2893
Cannot open a GPU Profiler session once we rename it, after re-starting Visual Studio.	2912
CPU Profiler does not display symbol information on importing a .prd file.	2942
The GPU debugger does not display OpenGL® static buffers when running inside the Visual Studio extension and 'Break' is clicked.	3167
Modules are identified as 'Unknown' in Power Profiler sessions when the profiled process is run after the profiler's command line tool session began.	3168
Some Steam games may crash when Steam is launched from CodeXL Frame Analysis mode.	3172
Visual Studio displays error "The following session files could not be deleted" when deleting a CodeXL Power Profiling session.	3179
Filtering the CPU Profiling display based on CPU Core/Numa is disabled in the display filter.	3233
When CPU Profiling on Linux®, C++/Java inline functions are shown with generic names or missing.	3240
The Vulkan versions of Doom and The Talos Principle fail to start when launched from Steam as part of a Frame Analysis session on Windows®.	3364
When launching the Vulkan version of DOTA2 from Steam as part of a Frame Analysis session on Linux®, The game must be manually shutdown at the end of the session else viewing frame traces and session export will fail.	3381
The CPU Profiler's Overview '5 Hottest functions' table does not filter out JVM functions when profiling Java applications on Linux®.	3497
Double clicking a function name in the CPU Profiling session's Functions view displays an empty source view for profiled Java applications on Linux®.	3498
Double clicking a module name in the CPU Profiling session's Overview displays an empty source view for profiled Java applications on Linux®.	3499
On Linux®, GPU Profiling Performance Counters of an OpenGL® application may cause a system hang after a few seconds.	68152
In Power Profile sessions on machines without Catalyst installed, 'iGPU Frequency' is constantly shown as 100MHz. If Catalyst is installed, then CodeXL reports the proper integrated-GPU frequency.	459364
Collecting GPU Profiler performance counters on the integrated GPU on an APU while another 3D app is running outside CodeXL can lead to a display hang.	68176
Debugging OpenCL™ kernels with optimizations disabled may cause kernel hang / driver not responding (TDR) in Radeon Software Crimson Edition (driver 15.30).	80095
For Power Profiler's Process/Module profiling, "Process Name" and "Process path" is shown as "unknown" for some of the user space applications.	3792
Timeline view's energy/power graphs highlight multiple (first counter is always shown selected) counters though only one counter is selected.	3873
Some power profile counters are all plotted in Black for imported session.	3877
On Linux®, first run after killing power profile run gives zero records.	3902

For process/module profiling, Irrespective of admin/non-admin privilege, launch app with CodeXLPowerProfiler CLI is always shown as unknown.	3904
For Remote Power Profiling, counters are shown without Counter Type (heading: Power, Frequency, Temperature).	3914
Caching of files/.pdb/executable not working with CPU Profiling session.	3244
On Linux®, "5 Hottest functions" does not show correct functions for CPU profiling using Java app (scimark2).	3497
For huge source files (like sqlite3.c), CodeXL source view does not show the complete source code - View seems to limit to 64K lines	3541
Samples not attributed to source for functions that belong to huge (100K+ lines) source file	3542
On AMD Ryzen, CPU Profiler does not support pre-defined profile configurations. User has to use the Custom Profiler to select the required PMC or IBS events.	
On AMD Ryzen, selecting multiple PMC or IBS events to perform CPU profiling may not work properly.	
On AMD Ryzen, IBS Profiling may not be enabled by default. In that case, IBS can be enabled through BIOS settings.	
On Linux® OS, CPU Profiler may show zero samples for IBS Fetch event.	3773
Samples reported differs in Overview tab and Callgraph view.	3785
CodeXL displays empty source view if debug information (.pdb) is not present for the profiled application.	3566
Visual Studio plugin crashes on running power profile session by "New Power Session..."	3908
Source view for Java inline functions shows no samples for the source.	3912
Installing APP SDK will break GPU kernel debugging.	3815

Support

Please use our CodeXL Issues Page for bug reports, support and feature requests.