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## 1 What's New in AMD APP SDK v2.9.1

### 1.1 New features in AMD APP SDK v2.9.1

AMD APP SDK v2.9.1 includes the following new features:

- The AMD APP SDK can now be installed on Linux with root as well as non-root permissions.
- The installation logs display additional details about the status of the installation.
- Several samples have been enhanced.
- All the samples are now compatible with the `gcc` version, 4.8.1.
- The APARAPI samples have been updated to work with the latest APARAPI (OpenCL trunk) library.
- The OpenCV-CL samples now work with the `OpenCV 2.4.9` library.
- The AMD APP SDK Bolt samples have been updated to work with the Bolt 1.2 library.

For information about the features released in AMD APP SDK v2.9, see the *AMD APP SDK v2.9 Developer Release Notes* document.

### 1.2 Key features supported in the AMD Catalyst 14.4 driver

- Support for Kaveri graphics AMD Radeon R5/R6/R7
- Support for AMD Radeon R9 295X
- Full support for OpenGL 4.4
- Support for the following operating systems:
  - Windows 8.1 (32- and 64-bit versions)
  - Windows 7 (32- and 64-bit versions with SP1 or higher)

### 1.3 New features for AMD CodeXL version 1.4

The following new features for AMD CodeXL version 1.4 provide the following improvements to the developer experience:

- Microsoft Visual Studio 2013 CodeXL Extension
- New Shader Analyzer
- Support for Volcanic Islands family GPUs: debugging, profiling and analyzing.

- Enhanced Analyze Mode: streamlined operation, GUI selection of build options and extended analysis.
- Improved User Experience
- The ability to attach the CPU Profiler to a running process
- CPU Profiler now collects call stack of drivers and kernel mode code

## 2 Important Notes

- If you are using Windows, verify that the `AMDAPPSDKROOT` environment variable is present. If the variable is not present, add it and set its value to one of the following:
  - `C:\Program Files\AMD APP SDK\2.9-1` (for 32-bit OS)
  - `C:\Program Files (x86)\AMD APP SDK\2.9-1` (for 64-bit OS)
- The following values are returned when querying strings from OpenCL:
  - `CL_PLATFORM_VERSION`: OpenCL 1.2 AMD-APP (build #).
  - `CL_PLATFORM_NAME`: AMD Accelerated Parallel Processing.
  - `CL_PLATFORM_VENDOR`: Advanced Micro Devices, Inc.
- Check the Platform Vendor string, not the Platform Name, to determine AMD hardware. For example code that shows how to check and use the `CL_PLATFORM_VENDOR` string, see the AMD APP v 2.9 Samples.
- Driver support for 7xx generation GPUs is EOL. AMD drivers no longer support 7xx generation GPUs; this includes support for ATI Radeon™ HD and ATI Mobility Radeon™ HD 4000 series devices, ATI FirePro™ V8750, V8700, V7750, V5700, V2750, ATI Mobility FirePro™ M7740, and AMD FireStream™ 9270, 9250.
- To develop applications using deprecated OpenCL™ API calls, `#define CL_USE_DEPRECATED_OPENCL_1_1_APIS`.
- When parsing `#include` directives, the OpenCL compiler resolves relative paths using the current working directory of the application through the `-I` compiler option.
- It is necessary to install the 14.101 driver prior to installation of SDK 2.9.1. Vital components of AMD's OpenCL solution are now contained within the drivers.
- Under Windows, making OpenCL runtime calls from `dllMain` can result in undefined behavior.
- The binary `clinfo.exe` is located in the `\Windows\System32` directory.
- On Linux and Windows platforms, every GPU is assigned an ordinal number. To expose only a subset of GPUs to a specific application, make the following environmental variable definition: `GPU_DEVICE_ORDINAL=0,1,2 ...`.
- Support for Microsoft Visual Studio 2008 is deprecated.
- HD4XXX device support is EOL. Catalyst drivers no longer include support for these devices. See the OpenCL SDK driver and compatibility page for more details.
- See the AMD APP SDK 2.9.1 Samples Release Notes for known issues and important notes for the SDK samples.
- The AMD APP Profiler and AMD APP Kernel Analyzer are now provided as part of CodeXL, which is available as a separate download from <http://developer.amd.com/tools-and-sdks/heterogeneous-computing/codexl/>.

- See the CodeXL release notes for known issues and important notes for the SDK samples.

## 3 Naming Convention

For Windows:

- The `__stdcall` calling convention is used for all Windows platforms.
- Function names are undecorated.
- It is not possible to use this OpenCL DLL on Windows with an application that was linked against a library using the `__cdecl` calling convention.

For Linux:

- The calling convention is `__cdecl`.

## 4 Resolved Issues

For the latest information about the resolved issues in AMD APP SDK v2.9.1, see the [AMD APP SDK documentation page](#).

## 5 Known Issues

For the latest information about the known issues in AMD APP SDK v2.9.1, see the [AMD APP SDK documentation page](#).

### 5.1 Compiler

- The compiler may accept illegal cast-to-union (GNU GCC Extension) cases. In such cases, a warning is issued. This may be fixed in a future release.
- If an argument to an OpenCL kernel function is optimized away late in the compilation process, the compiler may fail to build or produce undefined results. This occurs when either an argument gets entirely optimized away or when part of an argument gets optimized away. Part of an argument can get optimized away if two (for 64-bit data types) or four (for all other types) consecutive components of an argument are not used where the first unused component is a multiple of 2 or 4.
- The string class in the C++ Wrapper API has been deprecated and its usage is not recommended.

### 5.2 Runtime

- The OpenCL runtime currently does not validate handles to OpenCL memory objects.
- On Windows, to prevent long programs from causing a dialog to be displayed indicating that the display driver has stopped responding, disable the Timeout Detection and Recovery (TDR) feature, which is trying to detect hangs in graphics hardware. To do this, use `regedit.exe` to create the following `REG_DWORD` entry in the registry, and set its value to 0:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\GraphicsDrivers\TdrLevel
```

This avoids the constant polling by the driver and the kernel to prevent long work units from monopolizing the device. (To restore default functionality, set the `TdrLevel` to 3.)

Note that Microsoft strongly discourages disabling this feature, and only recommends doing so for debugging purposes. Do so at your own risk.

- On Linux platforms, if a kernel deadlocks the GPU, the system becomes unresponsive for a few minutes, and both the X-window server and the application become defunct processes. The system must be rebooted in order to use the GPU again.
- If the `clGetPlatformIDs()` failed error is issued with a properly installed ICD while running 32-bit code on a 64-bit system, ensure that all necessary 32-bit libraries are installed. The specifics of this vary between Linux distributions; consult your OS documentation for more information. The `libGLU.so` library is known to trigger this problem, but there may be others, depending on the specific installation.
- In Linux for non-Southern\_Islands platforms, the OpenCL runtime currently exposes less than the total amount of memory physically available on the card. In Windows and on Linux or Southern-Islands-based platforms, the OpenCL runtime reports the total amount of physical memory for boards with up to 2 GB.

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