Intel® SDK for OpenCL™ - CPU only Runtime Package 16.1.1 for Intel® Core™ and Intel® Xeon® Processors Release Notes

Installation Guide and Release Notes

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1 Introduction

Intel® SDK for OpenCL™ - CPU only runtime package 16.1.1 adds OpenCL support for CPU devices.

More runtimes and drivers with support for Intel® Graphics and Intel® Xeon Phi™ coprocessor are available at https://software.intel.com/en-us/articles/opencl-drivers.

The CPU only runtime package is fully compatible with the Intel® SDK for OpenCL™ Applications – a complete development suite for developing, debugging and profiling OpenCL applications. For more information, see https://software.intel.com/en-us/intel-opencl.

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

Customer support

To learn more about this product, see documentation, FAQ, code samples and other support information at Intel OpenCL Support: https://software.intel.com/en-us/intel-opencl-support.

For technical support, including answers to questions not addressed in the installed product, go to the Intel OpenCL Forum: https://software.intel.com/en-us/forums/opencl.

2   What's New

16.1.1 release update includes:

- Fix for the known incompatibility issue with the CPU Kernel Debugger from the Intel® SDK for OpenCL™ Applications 2016 R2 and the CPU only runtime package version 16.1.

- Performance optimizations:

    o   Compiler vectorizer heuristic tuning for a set of workloads

    o   Workgroup fusion optimization improvements

    o   Performance enhancements of the `vload()`/`vstore()` built-in functions

- Fix for the issue reported on the forum (https://software.intel.com/en-us/comment/1844607#comment-1844607): vectorizer produces incorrect code on SSE42 architectures when using the samplerless `read_imagef()` built-in function with `image2d_t` and `int2` coordinates as arguments.

- cl_khr_gl_sharing extension was disabled due to incompatibility with the Microsoft* Basic Display Adapter. To use this extension, please install OpenCL Driver for Intel® Iris™ Graphics and HD Graphics for Windows* OS from https://software.intel.com/en-us/articles/opencl-drivers#iris. The driver package includes the OpenCL Runtime package for CPUs.

- Due to performance bug Threading Building Blocks (TBB) library was downgraded from 4.2,Interface version 7001, Oct 2 2013" to 4.2, Interface version 7005 , Jun 1 2014

16.1 release includes:

- Support for Intel® Core™ 6th generation and Xeon® v4 processors (former Intel microarchitecture codename Broadwell)

- Support for OpenCL™ 2.0 specification

- Improved cross-CPU support of pre-compiled kernel binary in Runtime:

    o   Enables loading pre-generated kernel binaries that saves OpenCL program build time. For more information, see https://software.intel.com/en-us/node/540584

    o   Enables generating a JIT binary for target CPU model by the Intel® SDK for OpenCL™ - Offline Compiler. For more information, see https://software.intel.com/en-us/node/539388

- Bug and memory leak fixes.

- Compiler infrastructure was updated to LLVM version 3.6.2

NOTE: OpenCL Runtime 16.1 supports CPU only. For Intel® Xeon Phi coprocessor support, use the OpenCL runtime 14.2. For more information see OpenCL™ runtime entry and release notes on the OpenCL driver page at: https://software.intel.com/en-us/articles/opencl-drivers

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3   System Requirements

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

Processor Requirements

The OpenCL Runtime provides OpenCL CPU device support on the following processors:

- Intel® Core™ Processors with Intel Streaming SIMD Extensions 4.2 (Intel SSE4.2) support or higher

- Intel Xeon Processor E3, E5, E7 families with Intel SSE4.2 support or higher

OpenCL™ Runtime 16.1.1 provides optimizations for processors that support following instruction sets:

- SSE4.2

- AVX

- AVX2

To enable GPU device support on the aforementioned processors, install the Intel Graphics driver. The graphics driver includes the CPU runtime as well.

NOTE: Incompatible or proprietary instructions in non-Intel processors may cause the analysis capabilities of this product to function incorrectly. Any attempt to analyze code not supported by Intel® processors may lead to failures in this product.

Supported Operating Systems

The following is the list of supported operating systems:

Linux* Operating Systems:

- Red Hat Enterprise Linux* OS 6.5 or higher (64-bit version)

- SUSE Linux Enterprise Server* 11.3 or higher (64-bit version)

- Ubuntu* 14.04

- Cent OS 7.0 or higher (64-bit version)

Windows* Operating Systems (32- and 64-bit):

- Microsoft Windows* 7 SP1

- Microsoft Windows 8 / 8.1

- Microsoft Windows Server 2008 R2

- Microsoft Windows Server 2012

- Microsoft Windows 10

Due to possible incompatibility of Intel® Advanced Vector Extensions (Intel AVX) issues with the default glibc 2.11.1 implementation, the product libraries require glibc-2.12-1.47 or higher. Refer to the OS documentation for more information.

4 Installation Notes

Installation on Microsoft Windows* OS
To install the Intel® SDK for OpenCL™ - CPU only runtime package on Windows* operating systems, download the Runtime package and follow the installer prompts.

To remove the Intel® SDK for OpenCL™ - CPU only runtime package, go to **Control Panel** > **Programs and Features** > **OpenCL™ Runtime** > **Uninstall**.

The uninstaller removes all originally installed files, leaving any temporary or newly created files. To ensure a clean uninstallation, verify that the `INTELOCLSDKROOT`, `INTELOCLSAMPLESROOT`, and `PATH` environment variables are in their preinstall state.

Installation on Linux* OS

4.1.1 Installing the Product

1. Extract the TGZ archive contents:
   ```
   # tar xzf opencl_runtime_16.1.1_x64_<OS>_<VERSION>.tgz

   # cd opencl_runtime_16.1.1_x64_<OS>_<VERSION>
   ```


2. Run the following command (for command-line interface) and follow the installer prompts:

```
# ./install.sh
```

Alternatively (for installation with graphical user interface) run the following command:

```
# ./install_GUI.sh
```

4.1.2   Uninstalling the Product
To uninstall the product using the uninstallation script, do the following:

1. Go to the folder with the OpenCL runtime installation (for example, /opt/intel/opencl).

2. Run the uninstall.sh script.

You can use the OS-specific command to remove all the packages, starting with "`opencl-1.2-`". To do so, run the following commands:

For Red Hat Enterprise Linux OS:

```
# sudo yum remove "opencl-1.2-*"
```

For SUSE Linux Enterprise OS:

```
# sudo zypper remove "opencl-1.2-*"
```

5   Installation and Configuration Issues
Intel® SDK for OpenCL™ - CPU only runtime package installer adds the target installation folder of the CPU runtime to the end of the system `PATH` environment variable. If the variable is too long, the application might not be able to load the CPU runtime DLL files. To solve the problem, move the folders to the beginning of the `PATH` variable or delete unnecessary folders from the `PATH`.

6   Known Issues

*   OpenCL Runtime requires Intel® Threading Building Blocks (Intel® TBB) version 4.2.1, which is included in the OpenCL Runtime package installation folder. Make sure there is no Intel TBB version conflict in your system upon runtime installation.

    o   Any standalone Intel TBB package loaded by the OpenCL host-code should be of higher version than the OpenCL/ Intel TBB version.

- The standalone Intel TBB package must use the default Intel TBB configuration, which is also used by the OpenCL runtime.

- Make sure you use and load the right Intel TBB libraries. For example, if you plan to use new features of a standalone Intel TBB version higher than the OpenCL version, ensure that the corresponding standalone Intel TBB libraries are correctly loaded (`LD_LIBRARY_PATH` in Linux or `PATH` in Windows is correct).

- Device fission extension is not supported. Only device fission core feature is supported.

- Intel® SDK for OpenCL™ - CPU only runtime package for Linux* returns 1.2.0.10003 as platform version via CL_DRIVER_VERSION. The correct version is 6.4.0.19. On Windows platform version is reported correctly

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