

# OpenCL™ Runtime 15.1 for Intel® Core™ and Intel® Xeon® Processors Release Notes

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Installation Guide and Release Notes

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## 1 Introduction

OpenCL™ Runtime 15.1 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/intel-openccl>.

The runtime is supported with Intel tools for OpenCL development, such as the OpenCL™ Code Builder. See more information also at <https://software.intel.com/en-us/intel-openccl>.

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

To learn more about this product's:

- Documentation, help, and samples, see the OpenCL support page at <https://software.intel.com/en-us/intel-openccl-support>
- Technical support, including answers to questions not addressed in the installed product, visits the technical support forum at: <https://software.intel.com/en-us/forums/openccl>.

## 2 What's New

**Update 15.1 release includes:**

- New performance-related environment variables:
  - o `CL_CONFIG_CPU_RT_LOOP_UNROLL_FACTOR` for loop unrolling of loops with non-constant trip count (CPU only);
  - o `CL_CONFIG_USE_FAST_RELAXED_MATH` for enabling computations with floating-point calculation optimizations (forcing `-cl-fast-relaxed-math`).
- Improved MS Visual Studio\* debugging of OpenCL kernels on CPU device.
- Bug and memory leak fixes.
- Several performance enhancements including better auto-vectorization and alias analysis of OpenCL kernels for CPU device.

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**NOTE:** OpenCL Runtime 15.1 provides support for CPU only device. 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
- Intel Xeon Processor E3, E5, E7 families

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 6.1 or higher (64-bit version)

- SUSE Linux Enterprise Server\* 11.2 or higher (64-bit version)
- Ubuntu\* 12.04 and 14.04

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

Due to possible Intel® AVX issues with the default glibc 2.11.1 implementation, the product libraries might 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 OpenCL™ Runtime on Windows operating systems, download the Runtime package and follow the installer prompts.

To remove the OpenCL Runtime, use the **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

All RPM packages of the OpenCL Code Builder are digitally signed.

Verify signature of each RPM package after downloading.

To verify signatures, do the following:

1. Download the public key from the download page of the product.
2. Import public key into rpm database by use of the following command:  

```
# sudo rpm --import Intel-E901-172E-EF96-900F-B8E1-4184-D7BE-0E73-F789-186F.pub
```
3. Verify signature of RPM package:  

```
# rpm --checksig <rpm name>.rpm
```

where `<rpm name>` is the name of the RPM package.

Expected output for RPM with a valid digital signature is:  
`<rpm name>.rpm: rsa sha1 (md5) pgp md5 OK`

#### 4.1.1 Installing the Product

1. Extract the TGZ archive contents:

```
# tar xzf openc1_runtime_15.1_x64_<VERSION>.tgz  
  
# cd openc1_runtime_15.1_x64_<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 to which you extracted the TGZ archive content.
2. Run the `uninstall.sh` script.

You can use the OS-specific command to remove all the packages, starting with “`openc1-1.2-`”. To do so, run the following commands:

For Red Hat Enterprise Linux OS:

```
# sudo yum remove "openc1-1.2-*"
```

For SUSE Linux Enterprise OS:

```
# sudo zypper remove "openc1-1.2-*"
```

## 5 Installation and Configuration Issues

OpenCL™ 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 4.2.5, 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.
- When an OpenCL application is invoked, the **OpenCL** path should be the first path in `LD_LIBRARY_PATH`.

For example:

### CSH

```
setenv LD_LIBRARY_PATH ${OCL_INSTALL_DIR}\bin:${LD_LIBRARY_PATH}
```

### BASH

```
export LD_LIBRARY_PATH=${OCL_INSTALL_DIR}\bin:${LD_LIBRARY_PATH}
```

- Device fission extension is not supported. Only device fission core feature is supported.
- Known issues with Intel® VTune™ Amplifier XE 2013 source-view support:
  - Source-level profiling does not work properly when functions are included (using `#include`) from other files.
  - Note that due to function inlining, the profiling data is aggregated into the top-level kernel.
  - Source information for code built with "`-g`" does not appear on kernels, only on user functions.
- The current TBB version used with OpenCL/CPU is 4.2.5 (4.2 update 5).
  - Any standalone TBB package loaded by the OpenCL host-code should be of higher version than the OpenCL/TBB version.
  - The standalone TBB package must use the default TBB configuration, which is also used by the OpenCL runtime.
  - Make sure you use and load the right TBB libraries. For example, if you plan to use new features on a standalone TBB version higher than OpenCL, ensure that the corresponding standalone TBB libraries are correctly loaded (`LD_LIBRARY_PATH` in Linux or `PATH` in Windows is correct).

- OpenCL Runtime for Linux\* returns 1.2.0.57 as platform version via `CL_DRIVER_VERSION`. The correct version is 5.0.0.57.

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