

# Intel® Software Guard Extensions SDK for Linux\* OS Release Notes

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## 1 Introduction

Intel provides Intel® Software Guard Extensions (Intel® SGX) SDK, a software isolation technology, to help you protect your applications.

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

### Product Contents

Intel® Software Guard Extensions SDK package includes:

- An Intel® Software Guard Extensions SDK installer for Linux\* OS. It includes binaries to develop enclave applications. The main components include:
  - Trusted libraries, including standard C library, C++ runtime support, C++ STL, and others
  - Development tools, including edger8r, signing tool, and others
  - Sample projects

## 2 What's New

Intel® Software Guard Extensions SDK includes the following changes in version 2.1.100.41820:

- Add new `sgx_register_wl_cert_chain` API for SGX application to register enclave
- Support for CentOS\* 7.4
- Support for SUSE\* Linux Enterprise Server 12
- Bug fixes

## Changes in Previous Releases

Intel® Software Guard Extensions SDK includes the following changes in version 2.0.100.40950:

- Support for Intel® SGX Enclave Dynamic Memory Management (EDMM) to dynamically manage enclave memory: dynamic heap expansion, dynamic stack expansion, dynamic thread creation and page attribute modification
- Support for Red Hat\* Enterprise Linux\* Server 7.4
- Support for Safe String APIs of C library in enclave
- Added an option to build the Intel® SGX SDK using the Intel® SGX SSL crypto library instead of the Intel® IPP Cryptography open source version
- Bug fixes

Intel® Software Guard Extensions SDK includes the following changes in version 1.9.100.39124:

- Added C++11 support

To improve support for C++11 in Linux, Linux SDK 1.9 includes a new trusted C++ library based on `libc++` (see <http://llvm.org/svn/llvm-project/libcxx/trunk>). Note that the Standard C++ Library based on `STLPort` (`sgx_tstdcxx`) will be deprecated in the next release.

- Support for Protected File System – a basic subset of the regular 'C' file API for Intel SGX enclaves that provides files with both confidentiality and integrity protection
- Bug fixes

Intel® Software Guard Extensions SDK includes the following changes in version 1.8.100.37689:

- Support for the `TCMalloc` library
- Support for new Linux\* distributions. See Software Requirements for details

- Bug fixes

Intel® Software Guard Extensions SDK includes the following changes in version 1.7.100.36470:

- Cryptography for Intel® Integrated Performance Primitives (Intel® IPP) library is updated to version 9.0 Update 4
- Bug fixes

Intel® Software Guard Extensions SDK includes the following changes in version 1.6.100.34478:

- New `setjmp/longjmp` APIs in the trusted C library
- Bug fixes

Intel® Software Guard Extensions SDK includes the following changes before version 1.5.100.32783:

- Support for profiling Intel SGX applications using Intel® VTune™ Amplifier. To profile Intel SGX applications, use VTune™ Amplifier 2016 Update 2, the “Intel SGX Hotspots” analysis type.
- Intel® SGX Eclipse\* plug-in to create Intel SGX enclave projects
- Support for implicit Thread Local Storage (TLS)
- Support for nested HW exception in a trusted environment

## 3 System Requirements

### Software Requirements

- Supported Linux\* OS distributions:
  - Ubuntu\* 16.04.3 LTS 64-bit Desktop version
  - Ubuntu\* 16.04.3 LTS 64-bit Server version
  - Red Hat\* Enterprise Linux\* Server 7.4 (for x86\_64)
  - CentOS\* 7.4 (for x86\_64)
  - SUSE\* Enterprise Server 12 (for x86\_64)

**NOTE:** It is highly recommended to use the listed Linux\* OS distributions. Other distributions have not been tested.

## 4 Known Issues and Limitations

- Intel® SGX for Linux\* OS does not support setting a different charset in GNU\* Project Debugger (GDB\*).
- Building the Intel SGX SDK sample project “RemoteAttestation” is possible only within the Intel SGX SDK installation folder.
- Intel SGX does not support the “long long” type in C++ templates.
- sgx-gdb depends on GDB\* 7.9.1 or later versions. Please upgrade GDB\* if it is lower than 7.9.1.

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