

Intel® Software Guard Extensions

Installation Guide

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Notice revision #20110804

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Revision History

Revision Number	Description	Revision Date
1.5	SGX Linux 1.5 release	May 2016

Intel(R) Software Guard Extensions SDK and Platform Software Installation

This document provides the instructions on how to install Intel(R) Software Guard Extensions SDK and platform software. You can see the details in the following topics:

- [Install Intel\(R\) Software Guard Extensions SDK and Platform Software](#)
- [Install Intel\(R\) Software Guard Extensions Eclipse* Plug-in](#)

Install Intel(R) Software Guard Extensions SDK and Platform Software

The current Linux* OS installation packages include three binary installers packaged separately:

- Installation package for Intel(R) Software Guard Extensions (Intel(R) SGX) driver
- Installation package for Intel(R) SGX platform software (PSW)
- Installation package for Intel(R) SGX SDK

Download the following installation packages:

- Intel(R) SGX driver: `sgx_linux_x64_driver.bin`
- Intel(R) SGX PSW: `sgx_linux_x64_psw_<version>.bin`
- Intel(R) SGX SDK: `sgx_linux_x64_sdk_<version>.bin`

NOTE

Only 64-bit installation packages are available.

You need the root (or sudo) privilege to install the packages, and install them in following order:

1. Intel(R) SGX driver
2. Intel(R) SGX PSW
3. Intel(R) SGX SDK

For example, if you want to install the packages on an Ubuntu* operating system, use the following steps:

1. Install the Intel(R) SGX driver package using the following command:

```
$ sudo ./sgx_linux_x64_driver.bin
```

This command installs the driver to default Ubuntu* kernel module sub-directory, for example, `/lib/modules/3.13.0-32-generic/kernel/drivers/intel/sgx/` on Ubuntu* 14.04.

The installer also loads the driver and sets it to be `auto-load` when the machine reboots.

After the Intel(R) SGX driver installation, you can see a generated script `uninstall.sh` under the `/opt/intel/sgxdriver` directory. You can use this script to uninstall the driver.

2. Install the Intel(R) SGX PSW package using the following command:

```
$ sudo ./sgx_linux_x64_psw_<version>.bin
```

The Intel SGX platform software package includes user space libraries such as uRTS and AESM. After installation, the libraries are installed to the directory `/usr/lib`. The AESM service executable and the AE libraries are installed to the directory `/opt/intel/sgxpsw/aesm`.

The installer also configures the AESM service as a system daemon, which starts with the user ID `aesmd`. The default home directory of the AESM service is `/var/opt/aesmd`.

After installing the platform software, you may need to setup an http proxy server for the AESM service. You can use the file `/etc/aesmd.conf` as a reference. This file shows an example on how to setup the proxy but it is commented out.

After the Intel(R) SGX PSW installation, you can see a generated script `uninstall.sh` under the `/opt/intel/sgxpsw` directory. You can use this script to uninstall the platform software.

3. Install the Intel(R) SGX SDK using the following command:

```
$ sudo ./sgx_linux_x64_sdk_<version>.bin
```

After the installation, the Intel SGX SDK package is installed into the directory `/opt/intel/sgxsdk`. You need to setup the `PATH` environment variable to point to `/opt/intel/sgxsdk/bin/x64`, either in your bash profile or in the make file scripts as shown in the sample code.

You can also see a generated script `uninstall.sh` under the `/opt/intel/sgxsdk` directory and use it to uninstall the Intel(R) SGX SDK.

NOTE

The default installation directories for Intel(R) SGX PSW and Intel(R) SGX SDK are different:

- The Intel(R) SGX PSW package installs the user space libraries in `/usr/lib`.
- The Intel(R) SGX SDK package installs the corresponding shell libraries in `/opt/intel/sgxsdk/lib64`.

Shell libraries contain the declaration of the public APIs and are only needed for building Intel SGX applications. At runtime, the standard user-space libraries in `/usr/lib` are loaded automatically.

NOTE

Sample code is installed under `/opt/intel/sgxsdk/SampleCode` directory with read-only permissions for normal users. Each user can make separate copies to modify, build and experiment with the sample codes.

To uninstall Intel(R) SGX, run the corresponding `uninstall.sh` scripts with root privilege to uninstall the components in the following order:

1. Uninstall the Intel(R) SGX SDK
 2. Uninstall the Intel(R) SGX PSW
 3. Uninstall the Intel(R) SGX driver
-

Install Intel(R) Software Guard Extensions Eclipse* Plug-in

The Intel(R) Software Guard Extensions Eclipse* Plug-in for Linux* OS helps the enclave developer to maintain enclaves and untrusted related code inside Eclipse* C/C++ projects.

This section contains steps to set up your Intel(R) Software Guard Extensions Eclipse* Plugin on a Linux* system, including necessary softwares, steps to install the product, and steps to configure your preferred product directory.

- [Prerequisites](#)
- [Installation](#)
- [Configuration](#)

Prerequisites

To use Intel(R) Software Guard Extensions Eclipse Plug-in, install the following softwares:

- Eclipse* Mars 1 with CDT IDE for C/C++ Developers (version 4.5.1). To use this version, install Java* Development Kit (JDK) or Java* Runtime

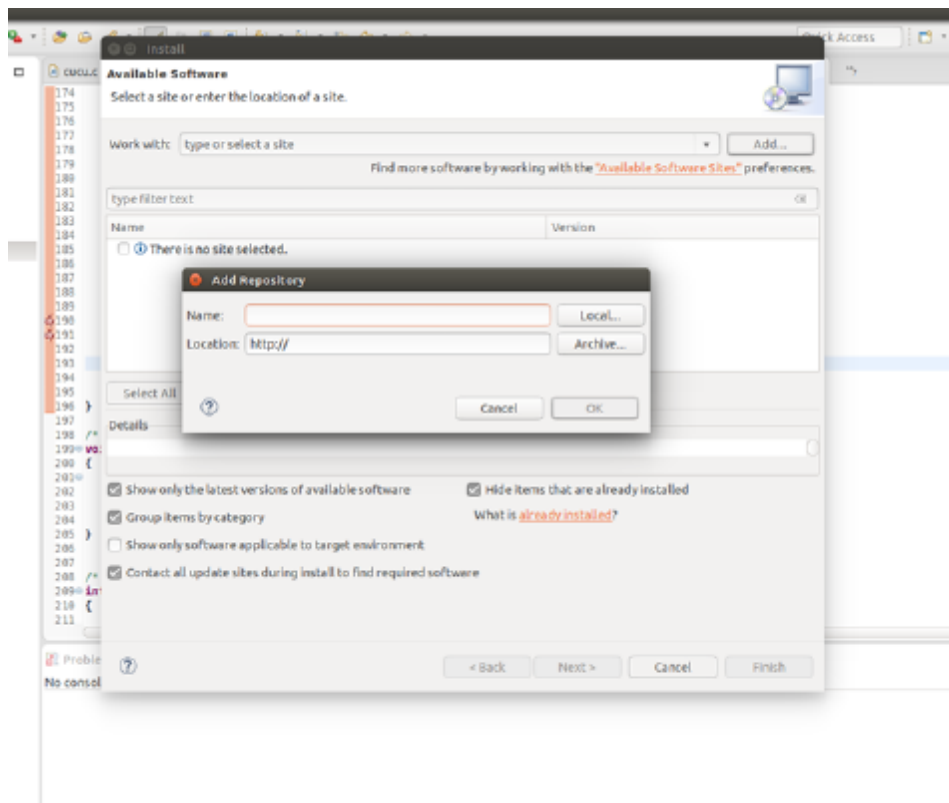
Environment (JRE) version 1.8 or above.

- gcc*/g++ tools
- Openssl*
- Intel(R) SGX SDK for Linux* OS

Installation

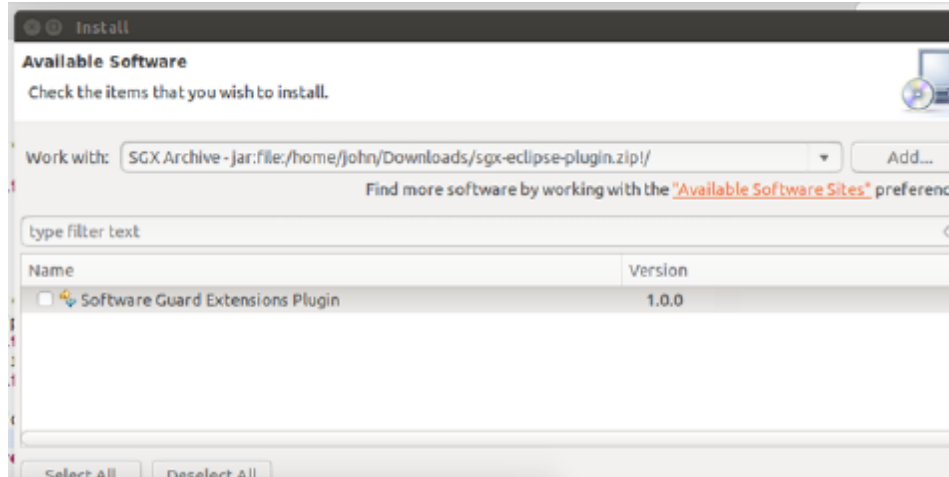
Install Intel(R) Software Guard Extensions Eclipse* Plug-in as a regular Eclipse Plugin:

1. Download the zip archive of Intel(R) Software Guard Extensions Eclipse Plug-in from Intel Site
2. Go to **Help** menu -> **Install New Software**. Click the **Add** button for the **Work with** field to open the **Add Repository** dialog as shown in the following graphic:



Add Repository Dialog

3. Enter SGX Archive in the **Name** field . Click the **Archive...** button and select the location of the downloaded archive as shown in the following graphic:



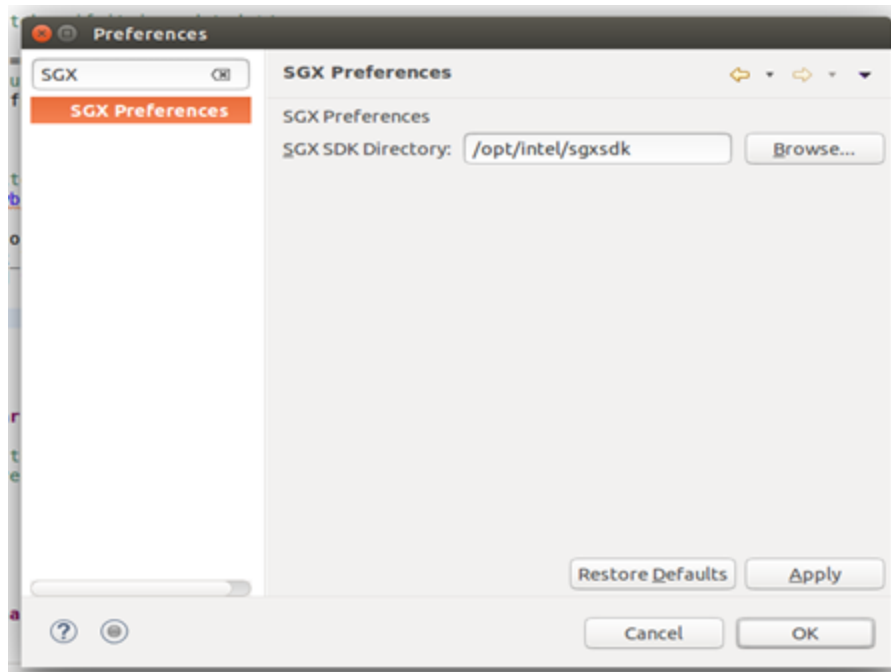
The Location of the Plugin zip Archive

4. Press **OK** to add the archive as a repository.
5. In the **Install** dialog, select the **Software Guard Extensions Plugin** check-box and proceed with the usual steps.

Configuration

If you do not install Intel(R) SGX SDK for Linux* OS in the default location, you need to specify the path for Intel SGX SDK using the following steps:

1. Go to **Window menu ->Preferences**. Enter SGX in the filter text field to quickly locate the **SGX Preferences** page.



SGX Preference Page

2. Enter the path for Intel(R) SGX SDK for Linux OS in the **SGX SDK Directory** field.