

# SDK Dispatcher ReadMe

[Overview](#)

[SDK Implementation Registration](#)

[Software SDK Implementations](#)

[Platform-Specific SDK Implementations](#)

[The Dispatching Procedure](#)

[Additional Recommendations](#)

[Build Instructions](#)

[Legal Information](#)

## Overview

This document describes the design of the SDK Dispatcher.

The dispatcher is a layer that lies between application and SDK implementations. Upon initialization, the dispatcher locates the appropriate platform-specific SDK implementation. If there is none, it will select the software SDK implementation. The dispatcher will redirect subsequent function calls to the same functions in the selected SDK implementation.

We recommend that applications always use the SDK functions through a dispatcher since platform-specific SDK implementations or software SDK implementations may have different names and reside in separate locations. The dispatching process represents a unique way to locate these SDK implementations.

To maintain forward and backward compatibility, we do not recommend modifying the dispatcher in any way, except in the following cases:

- Debugging in the case that the dispatcher fails to locate an SDK implementation
- Compiling the dispatcher library with a compiler that the SDK does not support
- Tailoring redirected function entries to those applications actually used for a smaller footprint

## SDK Implementation Registration

Both *software* and *platform-specific* SDK implementations installed on target system in the predefined folders.

### Software SDK Implementations

Software SDK implementations are installed on the system in the:

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Path	Platform type
/opt/intel/mediasdk/lib64	for Intel® 64 architecture

## Platform-Specific SDK Implementations

Platform-specific SDK implementations are installed on the system in the:

Path	Platform type
/opt/intel/mediasdk/lib64	for Intel® 64 architecture

Binary location customizable using standard cmake GNUInstallDirs, and affect both MediaSDK library and Dispatcher. Location here corresponds to default library location.

The dispatcher locates SDK implementations by their reserved names:

Library	Platform-Specific SDK Implementation
libmfxhw64.so.<mj>.<mn>	Reserved hardware library for Intel® 64 architecture

where <mj> - major version of the library's API, <mn> - minor version of the library's API.

Example 1 illustrates an example of registered SDK platform-specific implementations in the file structure:

```
$ls /opt/intel/mediasdk/lib64
libmfxhw64.so.1.29
```

**Example 1: SDK Platform-Specific Implementations in the file structure**

## The Dispatching Procedure

The following describes the dispatching procedure:

1. Enumerate graphics adapters on the system and get their device and vendor IDs. This is being done by searching for the adapter devices in the `/sys/bus/pci/devices` folder.
1. Search for the SDK Platform-Specific or Software implementation in the folder `/opt/intel/mediasdk/lib<arch>` depending on **MFxInit** parameters as follows:

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MFXInit Initialization Parameter	Device & Vendor Identifiers
MFX_IMPL_SOFTWARE	Try to load software implementation using predefined name <code>libmfxsw64.so.1.28</code>
MFX_IMPL_HARDWARE or MFX_IMPL_AUTO	First adapter in enumeration thru the adapters in <code>/sys/bus/pci/devices</code> .
MFX_IMPL_HARDWARE2 or MFX_IMPL_HARDWARE3 or MFX_IMPL_HARDWARE4	Second, third or fourth display adapter in enumeration thru the adapters in <code>/sys/bus/pci/devices</code> .
MFX_IMPL_HARDWARE_ANY	Try to load SDK implementation for adapters one by one. Stop at the first implementation successfully initialized

2. Searching for the SDK *platform-specific* implementation in the folder `/opt/intel/mediasdk/lib<arch>` defined on the previous step is done as follows:
  - o Load SDK implementation with the requested major API version and maximum minor API version which is higher or equal to requested one
3. Search the default SDK implementations in the default system paths or path addressed by `LD_LIBRARY_PATH` environment variable by first searching for *platform-specific* one (`libmfxhw64.so`) and then *software* (`libmfxsw64.so`).

## Additional Recommendations

To ensure SDK API compatibility, unless applications *explicitly* specify a version of an SDK implementation, we recommend that a dispatcher always match the SDK API version, during session initialization (**MFXInit**), with the latest released SDK API version.

## Build Instructions

To build dispatcher go to the `opensource/mfx_dispatch/linux` directory and execute following command sequence:

```
$ mkdir build
$ cd build
$ cmake ../
$ make
```

Binaries will appear in the folder `__bin`; for example:

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```
$ ls -l $MFX_HOME/opensource/mfx_dispatch/linux/build/__bin  
mfx.pc  libmfx.so  libmfx.so.1  libmfx.so.1.29  libmfx.pc
```

Starting with MediaSDK 2018 Q3.1 Dispatcher provided as dynamic library only.

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