

Intel® Media SDK for Linux* Servers Dispatcher

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Overview

This document describes the design of the Intel® Media SDK for Linux* Servers dispatcher.

The dispatcher is a layer that lies between applications and Intel Media 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 Intel Media 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 Intel Media SDK does not support
- Rebuilding the dispatcher static library to be a dynamically linked library (shared object) for modular design
- 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.

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Software SDK Implementations

Software SDK implementations are installed on the system in the:

| Path | Platform type |
|-------------------------------------|----------------------------|
| /opt/intel/mediasdk/lib64/0000/0000 | 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/<vendor_id>/<device_id> | for Intel® 64 architecture |

where <vendor_id> and <device_id> are IDs of the GPUs supported by Media SDK.

The dispatcher locates SDK implementations by their reserved names:

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

where p stands for **P**roduction build of the library, <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/lib64/8086/0162/  
libmfxhw64-p.so.1.10
```

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

The Dispatching Procedure

The following describes the dispatching procedure:

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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 implementation in the folder `/opt/intel/mediasdk/lib<arch>/<vendor_id>/<device_id>` where vendor/device IDs pair correlates with the **MFxInit** parameter as follows:

| MFxInit Initialization Parameter | Device & Vendor Identifiers |
|--|---|
| MFx_IMPL_SOFTWARE | Use DeviceId=0000 and VendorId=0000 |
| 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>/<vendor_id>/<device_id>` 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 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` directory and execute following command sequence:

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```
$ mkdir build
$ cd build
$ cmake -D__ARCH:STRING=intel64 ../
$ make
```

At the moment only make files generator for UNIX-like systems is supported. Specifying architecture is mandatory. Possible values are intel64 and ia32. Binaries will appear in the folder `__lib`; for example:

```
$ ls -l $MFX_HOME/opensource/mfx_dispatch/build/__lib
libdispatch_trace.lib
libmfx.lib
```

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Notice revision #20110804

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