

Media Samples Guide

Overview

Samples work with **Intel® Media SDK 2017** and **Intel® Media Server Studio 2017 - SDK for Windows* Server** (hereinafter referred to as "**SDK**").

They demonstrate how to incorporate the **SDK** API into various applications.

Some samples can work with **Intel® Media Server Studio – HEVC Decoder & Encoder** from Intel® Media Server Studio - Professional Edition (hereinafter referred to as "**HEVC Encoder**", "**HEVC Decoder**", "**HEVC**").

Not all of the samples listed below might be applicable and supported for a particular product. Make sure to check the respective release notes document for potential limitations.

What's New

- Conditional compilation markup is added. Now samples can be compiled with dispatcher library made for previous API versions. This samples package supports API 1.23, 1.22 and 1.21 (some features will be disabled if previous API is used).
- Projects and solutions are changed to be used with Microsoft Visual Studio 2015. Old project files designed for Microsoft Visual Studio 2010 are also present for backward compatibility.
- sample_encode is extended with new options:
 - P010 files provided as input for sample_encode for HEVC encoding should be in P010 format from this moment (data stored in low significant bits of DWORDs). Data will be internally shifted to LSB area if it is required by codec (some types of HEVC encoders may require data in MSB area).
 - -signal option is added, it sets transfer matrix coefficients for mfxExtVideoSignalInfo structure.
 - -dump option is added. It allows to print full configuration of encoder object into file (all configuration structures are printed in human-readable form).
- P210 support is added to sample_decode (software memory only).
- sample_camera is extended with new options:
 - -tcc - for total color control
 - -of NV12 - NV12 output format is added.
- sample_multi_transcode is extended with new options:
 - -i::rgb4_frame - new input type for creating alpha-blended overlays. This input file should contain one RGB4 frame with alpha channel.
 - -f - for setting new framerate for FRC and deinterlace.
 - -override_decoder_framerate and -override_encoder_framerate - for explicit overriding decoder and encoder framerates.
 - -vpp_comp_dump - saves non-compressed data directly to the file or just drops the data if null_render is set instead of file name
- Explicit composition tiling support is added to the sample_multi_transcode (-vpp_comp_tile_id and -vpp_comp_num_tiles).

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Package contents

Full list of available samples:

- **Video Decoding Sample**

Console application which performs decoding of elementary compressed video stream to raw frames. Includes the following features:

- stereoscopic 3D (S3D) rendering of elementary MVC (Multi-View Video Coding) streams
- decoding of HEVC (High Efficiency Video Coding) video via **HEVC Decoder**
- decoding with video post processing (color conversion) of raw video sequences
- screen capturing via screen capture plugin

- **Video Encoding Sample**

Console application which performs encoding of raw video frames into elementary compressed stream. Includes the following features:

- video resizing
- video rotation via User Plug-in Sample
- video rotation via User Plug-in Sample using OpenCL™
- encoding HEVC video via **HEVC Encoder**

- **Video Processing Sample**

Console application which performs various video processing algorithms on raw frames.

- **Video Transcoding Sample**

Console application which performs transcoding of elementary video stream from one compressed format to another. Includes the following features:

- multiple video streams transcoding
- video resizing, de-interlacing
- video rotation via User Plug-in Sample
- video rotation via User Plug-in Sample using OpenCL
- video processing using VPP algorithms

- **OpenCL Video Motion Estimation Sample**

Console application which provides step-by-step guidelines on the using Intel's motion estimation extension for OpenCL standard. The motion estimation extension includes a set of host-callable functions for frame-based Video Motion Estimation.

- **OpenCL Interoperability Sample**

GUI application which demonstrates how to use **SDK** and Intel® OpenCL SDK together for efficient video decoding and fast post-processing.

- **Intel® Media SDK RAW Media Accelerator Sample (Camera Sample)**

Console application that demonstrates how to use **SDK** and Intel® Media SDK RAW Media Accelerator together for efficient RAW camera data capturing and processing.

Each sample includes:

- a readme file for each sub-sample
- source and header files for each sub-sample

Samples package has one installer for all sub-samples.

Software & Hardware Requirements

Hardware:

- Hardware requirements are the same as described in **SDK Release Notes**
- (Optional) HDMI* 1.4, eDP* 1.1 or similar based monitor/TV as primary display
- (Optional) Active shutter glasses

Software:

- Microsoft Windows* 7, Microsoft Windows* 8, Microsoft Windows* 8.1 or Microsoft Windows* 10
- For Microsoft DirectX* 11 functionality - Microsoft Windows 8 or Microsoft Windows 8.1.
- Microsoft Visual C++* 2010 or later version of Microsoft Visual C++ (if exact version is not specified in particular sample readme).
- For samples - Microsoft Windows SDK for Windows 7 or Microsoft Windows SDK for Windows 8.
- For Microsoft DirectX 11 enabled samples - Microsoft Windows SDK for Windows 8.
- Intel® Media SDK 2017 or Intel® Media Server Studio 2017
- For **OpenCL User Plug-in, OpenCL Video Motion Estimation Sample and OpenCL Interoperability Sample - Intel® SDK for OpenCL™ Applications** (part of **Intel® Media SDK 2017 or Intel® Media Server Studio 2017**) for compilation, OpenCL driver – to run the samples.
- For PTIR feature in **Video Processing Sample - Intel® Media Server Studio 2017 Professional** edition is needed.

Installation

Run the `IntelMediaSamples.msi` installer from the package to install all the samples.

Build Instructions

1. `INTELMEDIASDK_WINSOCK_PATH` environmental variable:
 - **Samples** depend on Microsoft* Windows* SDK include and library files.
 - **Samples** installer will try to set `INTELMEDIASDK_WINSOCK_PATH` environment variable used in sample project files to locate those include and library files.
 - You may want to set (possibly to “”) `INTELMEDIASDK_WINSOCK_PATH` variable manually (possibly with the help of `<install-folder>\samples\set_INTELMEDIASDK_WINSOCK_PATH.bat`) in the following cases:
 - The variable was not set during installation due to no Microsoft Windows SDK installed or installed to a non-default location.
 - Your Microsoft Visual Studio* environment is already set up with Microsoft Windows SDK include and library directories (e.g. via registration script for Microsoft Visual C++* 2005). Set the variable to “” or delete it in this case.
 - You wish to use a different Microsoft Windows SDK version than was auto-detected and set at installation.
2. `INTELMEDIASDKROOT` environmental variable:
 - Samples depend on **SDK** external headers and **SDK** dispatcher library which are searched in folders `INTELMEDIASDKROOT\include` and `INTELMEDIASDKROOT \lib\<arch>` respectively.
 - `INTELMEDIASDKROOT` is set by **SDK** installer and points to the **SDK** installation folder.
3. OpenCL headers and libraries for **OpenCL User Plug-in, OpenCL Video Motion Estimation Sample and OpenCL Interoperability Sample**:
 - These samples require OpenCL headers and libraries to be available. All needed files are located in **Intel® SDK for OpenCL™ Applications** (part of **Intel® Media SDK 2017 or Intel® Media Server Studio 2017**). Please install SDK for OpenCL™ Applications from the package and set up `INTELOCLSDKROOT` environment variable to `<SDK-For-OpenCL-Applications-install-folder>\include\cl\` folder.
4. Building with Microsoft Visual C++*:

- Use provided with each sample solution file .sln with Microsoft Visual C++ version 2005 or later to build the respective sample. Locate the resulting executable file in the folder <install-folder>_build\<PlatformName>\<ConfigurationName>.
5. Choosing Microsoft Direct3D* version to build with:
- If version of the installed Microsoft Windows* SDK is 8.0 or above, then Microsoft Direct3D* 11.1 surfaces support will be enabled in sample by default. You can enable or disable it manually using MFX_D3D11_SUPPORT macros defined in <install-folder>\sample_common\sample_defs.h
6. Building using Debug configuration.
- Debug_WithDebugAPI configurations of samples are dependent on debug versions of dispatcher library (libmfx_d.lib). This library is an open source project, so you may build it from source code. Note, that libmfx_d.lib is not provided in binary form, so it has to be built manually. Source code of dispatcher library is available at **Intel® Media SDK 2017 and Intel® Media Server Studio 2017 for Windows Server**

Running the Software

Running **Samples** with Intel® OpenCL dependency:

- Make sure proper OpenCL driver is installed on the machine. Please refer to <https://software.intel.com/en-us/articles/opencl-drivers> for details.
- Add a path to opencl.dll from the driver installation above to PATH variable

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