

# Intel® Media Software Development Kit

## 2012 R3

### Release Notes

(Version 3.5.915.45249)

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## Overview

The **Intel® Media Software Development Kit** (Intel® Media SDK) is a software development library that exposes the media acceleration capabilities of Intel® platforms for decoding, encoding and video preprocessing. The API library covers a wide range of Intel platforms. The Intel Media SDK targets general application developers who want to integrate encoding and decoding into their applications.

Please see the "`<install-folder>\doc\MediaSDK Sample Guide.pdf`" for information on sample source code provided with the Intel Media SDK.

## New Features

The Intel® Media SDK 2012 R3 introduces Microsoft \* Windows\* 8 and Microsoft DirectX\* 11.1 support while maintaining the API version 1.4.

The whole range of Intel Media SDK sample applications are updated to support DirectX 11.1 including the addition of specific frame allocator sample.

Also a new Metro style sample application which showcases media files transcoding with parameter control using Metro design language is introduced.

For more details please see respective samples documentation.

## System Requirements

### Hardware

- IA-32 or Intel® 64 architecture processors with support for Intel® Streaming SIMD Extensions 2 instructions.

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- 200 MB free hard disk space.
- For S3D display functionality:
  1. 2nd Generation Intel® Core™ Processors with Intel® HD Graphics 3000/2000 or later
  2. HDMI\* 1.4, eDP\* 1.1 or similar based monitor/TV as primary display
  3. Active shutter glasses

## Software

- Microsoft\* Windows\* 7 or later
- Microsoft Visual C++\* 2005 with Service Pack 1 or later version of Microsoft Visual C++
- Microsoft Windows SDK for Windows 7 or later
- Specific requirements for Microsoft DirectX\* 11.1 functionality:
  - Microsoft Windows 8 Release Preview or later
  - Microsoft Windows SDK for Windows 8 Release Preview or later
- Specific requirements for Intel® Media SDK Simple Transcoder Sample:
  - Microsoft Windows 8 Release Preview or later
  - Microsoft\* Visual Studio\* 2012 RC or later
- Specific requirements for Intel® OpenCL™ User Plug-in sample - Intel® SDK for OpenCL™ Applications 2012.

## Package Contents

**Note:** The suffix <arch> indicates 32- or 64-bit Microsoft\* Windows\* (either "win32" or "x64"). Both are always installed to allow for cross-platform development.

<install-folder>	Intel® Media SDK Release Notes (this file), End User License Agreement (EULA) "Intel Media SDK EULA.rtf" and license file "license.txt"
<install-folder>\bin\<arch>	Intel® Media SDK Dynamic Library, software implementation:  libmfxsw32.dll for IA-32 architecture libmfxsw64.dll for Intel® 64 architecture
<install-folder>\doc	Intel® Media SDK documentation: <ul style="list-style-type: none"> <li>• Intel® Media SDK Reference Manual mediasdk-man.pdf</li> <li>• Intel® Media SDK Extensions for User-Defined Functions</li> </ul>

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	<p>mediasdkusr-man.pdf</p> <ul style="list-style-type: none"> <li>• Intel® Media SDK Extensions for Multi-view Video Coding mediasdkmvc-man.pdf</li> <li>• Intel® Media SDK Extensions for JPEG/Motion JPEG decoding mediasdkjpeg-man.pdf</li> <li>• Microsoft DirectShow* Filter Interfaces and Specifications MediaSDK Filters Specifications.pdf</li> <li>• Samples Overview MediaSDK Sample Guide.pdf</li> <li>• Intel® Media Developer's Guide Intel_Media_Developers_Guide.pdf</li> <li>• Intel® Media SDK Library Distribution and Dispatching Process mediasdk-distrib.pdf</li> </ul>
<install-folder>\ include	<p>External Intel® Media SDK headers:</p> <ul style="list-style-type: none"> <li>• Type definitions in mfxdefs.h</li> <li>• Structure definitions in mfxstructures.h</li> <li>• Function definitions in C in mfxvideo.h</li> <li>• C++ wrapper of the SDK functions in mfxvideo++.h</li> <li>• Extensions for Multi-view Video Coding options mfxmvc.h</li> <li>• Extensions for User-Defined Functions mfxplugin.h</li> <li>• C++ wrapper for User-Defined Functions mfxplugin++.h</li> <li>• Extensions for JPEG*/Motion JPEG Video Decoding options mfxjpeg.h</li> </ul>
<install-folder>\ lib\ <arch>	<ul style="list-style-type: none"> <li>• Static Dispatcher Library libmfx.lib</li> <li>• Static Dispatcher Library libmfxmd.lib build with /MD compiler option to compatibility with applications using the multithread- and DLL-specific version of the run-time library</li> </ul>
<install-folder>\ igfx_s3dcontrol\ include	<ul style="list-style-type: none"> <li>• S3D API definitions igfx_s3dcontrol.h</li> </ul>
<install-folder>\ igfx_s3dcontrol\ lib	<ul style="list-style-type: none"> <li>• Static S3D Control Library igfx_s3dcontrol.lib</li> </ul>

lib\<arch>	
<install-folder>\ igfx_s3dcontrol\	<ul style="list-style-type: none"> <li>• <b>Displaying S3D with Intel® HD Graphics Developers Guide</b> Displaying S3D with Intel HD Graphics.pdf</li> </ul>
<install-folder>\ samples\	<p>Contains the following source code samples:</p> <ul style="list-style-type: none"> <li>• Intel® Media SDK Encoding Sample in folder sample_encode</li> <li>• Intel® Media SDK Decoding and S3D Rendering Sample in folder sample_decode. A script for building a video wall application using this sample is provided.</li> <li>• Intel® Media SDK Transcoding Sample in folder sample_multi_transcode</li> <li>• Intel® Media SDK Video Processing Sample in folder sample_vpp</li> <li>• Intel® Media SDK Rotation Plug-in Sample in folder sample_user_modules\rotate_cpu</li> <li>• Intel® Media SDK OpenCL™ Plug-in Sample in folder sample_user_modules\rotate_opengl</li> <li>• Intel® Media SDK VPPPlugin Utility Class in folder sample_utilities\vpp_plugin</li> <li>• Intel® Media SDK Application Sample using Microsoft DirectShow in folder sample_dshow_player</li> <li>• Intel® Media SDK Plug-Ins Sample using Microsoft DirectShow in folder sample_dshow_plugins</li> <li>• Intel® Media SDK Application Sample using Microsoft Multimedia Framework Plug-ins in folder sample_studio</li> <li>• Intel® Media SDK Video Conferencing Sample in folder sample_videoconf</li> <li>• Intel® Media SDK Plug-Ins Sample using Microsoft Media Foundation* in folder sample_mfoundation_plugins</li> </ul> <p>A Metro style sample application for Microsoft Windows* 8 Release Preview or later:</p> <ul style="list-style-type: none"> <li>• Intel® Media SDK Simple Transcoder Sample in folder sample_simple_transcoder</li> </ul>
<install-folder>\ samples\_bin\<arch>	<p>Pre-built binaries of installed sample applications</p> <ul style="list-style-type: none"> <li>• If installed, console sample application binaries: sample_encode.exe sample_decode.exe (with sample_video_wall.bat) sample_vpp.exe sample_multi_transcode.exe</li> </ul>

	<p>sample_videoconf.exe</p> <ul style="list-style-type: none"> <li>• If installed, user plug-in sample binaries: sample_rotate_plugin.dll sample_plugin_openc1.dll (with ocl_rotate.cl)</li> <li>• If installed, Microsoft DirectShow sample binary application sample_dshow.exe</li> <li>• If installed, Microsoft DirectShow filters h264_dec_filter.dll h264_enc_filter.dll mpeg2_dec_filter.dll mpeg2_enc_filter.dll vc1_dec_filter.dll mvc_dec_filter.dll jpeg_dec_filter.dll imc_*.dll</li> <li>• If installed, Microsoft Multimedia Framework sample binary application sample_studio.exe sample_studio_builder.exe sample_studio_profiles.txt</li> </ul>
<p>&lt;install-folder&gt;\ tools\</p>	<p>Contains the following tools in binary form:</p> <ul style="list-style-type: none"> <li>• Intel® Media SDK Tracer in folder mediasdk_tracer. This utility performs runtime recording of Intel Media SDK API calls and parameters to a log file.</li> <li>• Intel® Media SDK System Analyzer in folder mediasdk_sys_analyzer. This utility analyzes the system and reports back Intel Media SDK related capabilities, graphics driver and components status.</li> </ul>

## Installation

1. Installation requires full administrative rights.
2. Extract files from the .ZIP file to the target hard drive.
3. Select the installer that matches the target system architecture:

File Name for Installer	Target System Architecture
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Intel(R)_Media_SDK_win32.msi	IA-32 architecture running Microsoft* Windows* 7 or Microsoft Windows 8 operating system
Intel(R)_Media_SDK_x64.msi	Intel® 64 architecture running Microsoft* Windows* 7 or Microsoft Windows 8 64-bit operating system

**Note:** If win32 is installed, the x64 lib and bin files are also present to enable cross-platform development and vice versa.

## Known Limitations

The Intel® Media SDK library has the following known limitations:

- The Intel Media SDK dispatcher `libmfx.lib` is best used with a standard DLL entry point (as recommended by Microsoft\*) when used in a DLL application such as a Microsoft DirectShow\* filter. The DLL entry point setting can be found under the Link > Advanced compiler options. Non-standard entry points can be used, but are not recommended.
- Loading of library `libmfxsw32.dll/libmfxsw64.dll` not through the dispatcher is unsafe.
- Using the Intel Media SDK in parallel with Intel® Threading Building Blocks could impact performance.
- Frames for different views in single AU in MVC encoder must be provided to encoder in order specified by `mfxMVCViewDependency`.
- `MXF_EXTBUFF_AVC_REFLIST_CTRL` and `MXF_EXTBUFF_CODING_OPTION_SPSPPS` external buffers are not supported by MVC encoder.
- MVC encoder supports `MXF_PROFILE_AVC_STEREO_HIGH` only.
- H.264 encoder doesn't support processing of `mfxExtPictureTimingSEI` template. During initialization 0xFFFF values will be reset to default values. In runtime 0xFFFF values will be put to bitstream as is.
- Known limitations for H.264 Multiple-Segment Encoding:
  1. Hardcoded HRD parameters: `bit_rate_scale = 0`, `cpb_size_scale = 3`
  2. Encoded `bit_rate_value_minus1`, `bit_rate_scale` represent BitRate from original SPS within precision of kbps (maximum supported BitRate is  $2^{16} - 1$  kbps).
  3. Encoded `cpb_size_value_minus1`, `cpb_size_scale` represent CpbSize from original SPS within precision of Kb (maximum supported CpbSize is  $2^{16} - 1$  Kb).
  4. Encoded `time_scale`, `num_units_in_tick` could be both multiplied by 2 if the `time_scale` from original SPS is odd.
  5. Conflicts between SPS/PPS and `mfxVideoParam` for parameters that are not covered by SPS/PPS could lead to change of parameters in SPS/PPS.

- `RefPicMarkRepSEI` syntax is not supported by MVC encoder.
- H.264 encoder is known to be slower on x64 platform than on win32 platform.
- If the MPEG-2 Video encoder `mfxVideoParam::mfxInfoMFX::CodecProfile` is initialized to 0, then the stream will be encoded as `MXF_PROFILE_MPEG2_MAIN`. Additionally if the MPEG-2 Video encoder `mfxVideoParam::mfxInfoMFX::CodecLevel` is initialized to 0, then the stream will be encoded as `MXF_LEVEL_MPEG2_MAIN`.
- `MXF_FRCALGM_DISTRIBUTED_TIMESTAMP` is unsupported by InverseTelecine and Deinterlace (60i->60p) VPP filters.
- Target usages 4 and 5 of H.264/MVC encoders are known to be non-monotonic in terms of encoding FPS versus encoding quality.
- Parameter `BRCParamMultiplier` is not supported by MVC video encoder.
- RGB32 as output color format for video pre-processing is allowed only if resize filter is enabled.
- H.264 decoder may consume more than 1 frame from the input bitstream and then propagate same timestamp to all of the consumed frames. If accurate time stamp handling is required the application has to make sure that it doesn't store more than one-frame wise data in the input bitstream.
- Target usage 7 of H.264/MVC encoders is known to have a non-monotonic quality vs. bitrate dependency.
- MPEG2 Video, VC-1 and MVC decoders are not optimized for low delay of output frames.
- MVC encoder produces streams with SPS and PPS headers before IDR frames only. You should set `mfxVideoParam::mfxInfoMFX::IdrInterval = 0` when encoding according to Blu-Ray and AVCHD standards.
- MVC encoder ignores any user SEI messages for the dependent view.
- Mpeg2 decoder returns only the first payload coded in the frame and ignores all the rest.
- AVC and MVC encoders don't support `pic_order_cnt_type` equal to 1. In case of progressive encoding w/o B-frames `pic_order_cnt_type = 2` is used. In other cases (B-frames, interlace) `pic_order_cnt_type = 0` is used.

## Other Limitations

- Limitations related to source code samples are discussed in their corresponding readme files. See "`<install-folder>\doc\MediaSDK Sample Guide.pdf`" for an overview of the samples and additional documentation.

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