

Intel® Media Software Development Kit

2014 R2 for Clients

Release Notes

(Version 5.0.0000461.91752)

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Overview

The **Intel® Media Software Development Kit for Clients (Intel® Media SDK for Clients)** 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.

New Features

Intel® Media SDK 2014 R2 introduces API version 1.9. This version is backwards compatible with the previous API version 1.8.

API version 1.9 introduces the following major features:

- Four new fourCC codes for color format were added:
 - `MFx_FOURCC_P010` and `MFx_FOURCC_A2RGB10` to support HEVC MAIN10 profile decoding and VPP resize and color conversion in 10-bit format. `MFx_FOURCC_A2RGB10` is specifically required for rendering on a 10 bit-display. Microsoft* DirectX* equivalent of `MFx_FOURCC_P010` format is currently not supported in Intel display drivers.
 - `MFx_FOURCC_ARGB16` and `MFx_FOURCC_R16` to support Intel® Media SDK Professional Camera Pack product. Please refer to [Intel Media Solutions Portal](#) for more details about this product.
- `mfxFrameInfo` structure was extended with controls for bit depth and shift which defines values alignment.
- VPP composition alpha blending support.

At the moment of this release this feature is supported only by Intel® Media SDK for Linux* Servers product.

- AVC skip frame control which forces skipped frame encoding.

At the moment of this release this feature is supported only by hardware implementations of Intel Media SDK Library coming with Intel® Iris™ and HD Graphics Driver for Microsoft Windows* 7/8/8.1 on platforms listed below in System Requirements section.

- AVC slice size limitation control.

At the moment of this release this feature is not supported by any implementation of Intel Media SDK Library.

- New `mfxExtAVCRefLists` extended buffer which allows application to manage reference lists.
- New plugin GUIDs definitions were added to `mfxplugin.h`:
 - `MXF_PLUGINID_VP8D_HW` and `MXF_PLUGINID_HEVCD_HW`: for hardware accelerated HEVC and VP8* decoder plugins which will be distributed as default plugins with graphics driver along with hardware implementation of Intel® Media SDK library. These components are not available in existing platforms and will be added in future.
 - `MXF_PLUGINID_CAMERA_HW`: for Intel® Media SDK Professional Camera Pack.

Additionally, dispatcher source code was updated with capabilities of default plugin loading, fixes for handling plugin version vs. library version during plugin loading and for compilation under MinGW* environment.

Please note that all the new APIs listed above are not supported by software implementation of Intel Media SDK Library, with exceptions for VPP resize in P010 format and VPP color conversions P010->A2RGB10 and P010->NV12.

In a particular platform specific hardware implementation of Intel Media SDK Library some of the features may also be unsupported. Make sure to call `Query` functions to check the actual support.

Please see the Intel Media SDK Reference Manual for details "`<install-folder>\doc\mediasdk-man.pdf`"

For information on the USER class please see "`<install-folder>\doc\mediasdkusr-man.pdf`"

For information on Multi-view Video Coding support please see "`<install-folder>\doc\mediasdkmvc-man.pdf`"

For information on JPEG*/Motion JPEG Video Coding support please see "`<install-folder>\doc\mediasdkjpeg-man.pdf`"

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System Requirements

Hardware

- IA-32 or Intel® 64 architecture processors with support for Intel® Streaming SIMD Extensions 2 instructions – for running software implementation of Intel® Media SDK Library.
- Hardware acceleration is available through hardware implementations of Intel Media SDK Library coming with Intel® Iris™ and HD Graphics Driver for Microsoft* Windows* 7/8/8.1 on platforms with:
 - 3rd Generation Intel® Core™ processors,
 - 4th Generation Intel® Core™ processors,
 - Selected SKUs of Intel® Celeron™ and Intel® Pentium™ processors with Intel HD Graphics which support Intel® Quick Sync Video.
 - Selected SKUs of Intel® Atom™ processors with Intel® HD Graphics which support Intel Quick Sync Video.

Additionally, hardware acceleration for API 1.4 feature set is available through hardware implementation of Intel Media SDK Library coming with Intel HD Graphics Driver for Microsoft Windows 7/8/8.1 on platforms with 2nd Generation Intel® Core™ processors.

- For S3D display functionality using `igfx_s3dcontrol` library:
 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 , Microsoft Windows 8 or Microsoft Windows 8.1
- For Microsoft DirectX* 11 functionality - Microsoft Windows 8 or Microsoft Windows 8.1.
- Microsoft Visual C++* 2005 with Service Pack 1, or later version of Microsoft Visual C++.

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.

<code><install-folder></code>	Intel® Media SDK Release Notes (this file), End User License Agreement (EULA) "Intel Media SDK EULA.rtf", a license file <code>license.txt</code>
<code><install-folder>\</code>	Intel® Media SDK Dynamic Library, software

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bin\<arch>	<p>implementation:</p> <p>libmfxsw32.dll for IA-32 architecture</p> <p>libmfxsw64.dll for Intel® 64 architecture</p>
<install-folder>\doc	<p>Intel® Media SDK documentation:</p> <ul style="list-style-type: none"> • Intel® Media SDK Reference Manual mediasdk-man.pdf • Intel® Media SDK Extensions for User-Defined Functions mediasdkusr-man.pdf • Intel® Media SDK Extensions for Multi-view Video Coding mediasdkmvc-man.pdf • Intel® Media SDK Extensions for JPEG*/Motion JPEG mediasdkjpeg-man.pdf • Intel® Media Developer's Guide Intel_Media_Developers_Guide.pdf • Intel® Media SDK Library Distribution and Dispatching Process Description mediasdk-distrib.pdf
<install-folder>\include	<p>External Intel® Media SDK headers:</p> <ul style="list-style-type: none"> • Type definitions in mfxdefs.h • Structure definitions in mfxstructures.h, mfxastructures.h, mfxvstructures.h and mfxcommon.h • SDK session related definitions in mfxsession.h • Video function definitions in C in mfxvideo.h • C++ wrapper of the SDK video functions in mfxvideo++.h • Audio function definitions in C in mfxaudio.h • C++ wrapper of the SDK audio functions in mfxaudio++.h • Extensions for Multi-view Video Coding options mfxmvc.h • Extensions for User-Defined Functions mfxplugin.h • C++ wrapper for User-Defined Functions mfxplugin++.h • Extensions for JPEG*/Motion JPEG Video coding options mfxjpeg.h
<install-folder>\lib\ <arch>	<p>Static Dispatcher Library libmfx.lib</p>

<install-folder>\ igfx_s3dcontrol\ include	S3D API definitions <code>igfx_s3dcontrol.h</code>
<install-folder>\ igfx_s3dcontrol\ lib\<arch>	Static S3D Control Library <code>igfx_s3dcontrol.lib</code>
<install-folder>\ igfx_s3dcontrol\ lib\<arch>	Displaying S3D with Intel® HD Graphics Developers Guide <code>Displaying S3D with Intel HD Graphics.pdf</code>
<install-folder>\ opensource\ lib\<arch>	Source code of Intel® Media SDK dispatcher
<install-folder>\ tools\ lib\<arch>	Contains the following tools in binary form: <ul style="list-style-type: none"> Intel® Media SDK Tracer in folder <code>mediasdk_tracer</code>. This utility performs runtime recording of Intel Media SDK API calls and parameters to a log file. Intel® Media SDK System Analyzer in folder <code>mediasdk_sys_analyzer</code>. This utility analyzes the system and reports back Intel Media SDK related capabilities, graphics driver and components status.

Installation

- Installation requires full administrative rights.
- Extract files from the .ZIP file to the target hard drive.
- Run the installer `Intel(R)_Media_SDK_x86_x64.exe`.

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:
 - Hardcoded HRD parameters: `bit_rate_scale = 0`, `cpb_size_scale = 3`
 - 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).
 - 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).
 - Encoded `time_scale`, `num_units_in_tick` could be both multiplied by 2 if the `time_scale` from original SPS is odd.
 - 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 (Intel Media SDK software library) 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 (Intel Media SDK software library) are known to be non-monotonic in terms of encoding FPS versus encoding quality.
- 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 (Intel Media SDK software library) 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 ignores any user SEI messages for the dependent view.
- `MXF_CORRUPTION_ABSENT_TOP_FIELD`, `MXF_CORRUPTION_ABSENT_BOTTOM_FIELD`, `MXF_BITSTREAM_EOS` are not supported by VC-1, MPEG2 Video and JPEG decoders.
- VPP always uses simple FRC algorithm based on repeat/drop frames and ignores `MXF_FRCALGM_FRAME_INTERPOLATION` flag.
- The feature set of JPEG decoder/encoder is limited to the following:
 - Baseline mode only
 - DCT based
 - 8-bit samples
 - sequential
 - loadable 2 AC and 2 DC Huffman tables
 - 3 loadable quantization matrixes
 - interleaved and non-interleaved scans
 - single and multiple scans
 - No extended, lossless and hierarchical modes
 - no 12-bit samples
 - no progressive
 - no arithmetic coding
 - no 4 AC and 4 DC Huffman tables
- H.264 encoder and decoder (Intel Media SDK software library) are known to be a little bit slower compared with Intel® Media SDK 2012 R2.
- The output AVC and MVC streams contain SPS and PPS headers before IDR frames only.
- `mfxExtVppAuxData::PicStruct` isn't supported by encoders and VPP.
- VPP scaling for RGB32 interlaced content may produce slightly blurred frames.
- JPEG decoder does not set `Corrupted` flag of `mfxFrameData` structure, and does not accept `MXF_BITSTREAM_EOS` as `DataFlag` of `mfxBitstream` structure.
- The Look Ahead bitrate control mode is not HRD compliant.
- `VPP::Reset` does not apply dynamic changes made to extended buffers such as `mfxExtVPPProcAmp`. The current workaround is to call `VPP::Close` directly followed by `VPP::Init` with the new configuration.
- The following APIs of API version 1.7 are not supported by software implementation of Intel Media SDK Library. Make sure to call `Query` functions to check actual support in hardware implementation of Intel Media SDK Library on particular platform.
 - `MXF_RATECONTROL_LA`
 - `mfxExtCodingOption2::MBBRC`, `ExtBRC`, `LookAheadDepth`, `Trellis`

- `mfxExtEncoderCapability`, `mfxExtEncoderResetOption`, `mfxExtAVCEncodedFrameInfo`
- The following APIs of API version 1.8 are not supported by software implementation of Intel Media SDK Library. Make sure to call `Query` functions to check actual support in hardware implementation of Intel Media SDK Library on particular platform.
 - `mfxExtVPPComposite`, `mfxExtVPPDeinterlacing`,
 - `mfxExtAVCRefListCtrl::ApplyLongTermIdx`, `LongTermIdx`
 - `mfxExtEncoderROI`
 - `mfxExtAVCEncodedFrameInfo::MAD`, `BRCPanicMode`, `QP`
 - `mfxExtCodingOption2::RepeatPPS`, `BRefType`, `AdaptiveI`, `AdaptiveB`, `LookAheadDS`, `mfxExtCodingOption2`
 - `MFX_RATECONTROL_ICQ`, `MFX_RATECONTROL_LA_ICQ`, `MFX_RATECONTROL_VCM`
 - `mfxInfoMFX::ICQQuality`
 - `mfxEncodeCtrl::SkipFrame`
- All the APIs of API version 1.9 are not supported by software implementation of Intel Media SDK Library, with exceptions for VPP resize in P010 format and VPP color conversions P010->NV12.
 In a particular platform specific hardware implementation of Intel Media SDK Library some of the features may also be unsupported. Make sure to call `Query` functions to check the actual support.
- AVC encoder can produce standard noncompliant bitstream in case of PCM encoding.
- AVC decoder will output frames in decoded order if the stream has `PIC_TIMING SEI` message with `dbp_output_delay=0`.
- To load plugins from Intel Media SDK HEVC Software Pack version 1.0.1.0 with Intel Media SDK software library from this release you need to call `MFXInit` with API version 1.8, not 1.9.
- `VPP::Query` function doesn't work correctly with `MFX_FOURCC_P010` and `MFX_FOURCC_A2RGB10` color formats. When using these formats, skip the `VPP::Query` step and use the `VPP::Init` directly.

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