Intel® Media Software Development Kit 2014 R2 for Windows* Servers Release Notes

(Version 5.0.0000364.93368)

Overview

The **Intel® Media Software Development Kit for Windows* Servers** (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.

New Features

Intel® Media SDK 2014 R2 for Windows* Servers exposes API version 1.10, but doesn't yet support any of the new features of 1.10 API.

Compared to the previous release which exposed API 1.8, this release supports the following new features (API 1.9):

- Hardware accelerated HEVC decode plugin, enabled through `MFX_PLUGINID_HEVCD_HW`. It is distributed with graphics driver along with hardware implementation of Intel® Media SDK library and supported only on Intel® Xeon® Processor E3-1200 **v3** product family (see System Requirements).

- `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.

  Please note that HEVC MAIN10 profile decoding is supported only with Intel Media SDK HEVC Pack and not with HW HEVC decode plugin.

- Intel® Media SDK Professional Camera Pack compatibility (enabled through `MFX_PLUGINID_CAMERA_HW` and supported with `MFX_FOURCC_ARGB16` and `MFX_FOURCC_R16` color formats) . Please refer to *Intel Media Solutions Portal* for more details about this product.

- Controls for bit depth and shift in `mfxFrameInfo` structure.

- AVC encode skip frame control (`mfxEncodeCtrl::SkipFrame`).

- New `mfxExtAVCRefLists` extended buffer which allows application to manage reference lists, including for B frames.

- 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 features listed above are not supported by or with software implementation of Intel Media SDK Library, with exceptions for VPP resize in P010 format and VPP color conversions P010->A2RGB10 and P010->NV12.

Hardware implementation of Intel Media SDK Library may not support some of the features on a particular platform. Make sure to use `Query` functions to check the actual support in your application.

The following differences between this release and Intel Media SDK 2014 R2 for Clients apply:

- This release supports only 64-bit Microsoft* Windows* applications.
- Microsoft DirectX* 11.1 is the only supported acceleration infrastructure (due to headless mode requirement).
- Intel Media SDK Samples: Media framework (Microsoft DirectShow*, Microsoft Media Foundation*) samples are not supported with this release.

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`"

System Requirements

Hardware

The following processor models are supported for hardware acceleration:

- Intel® Xeon® Processor E3-1285 v3 with Intel HD Graphics P4700
- Intel Xeon Processor E3-1285L v3 with Intel HD Graphics P4600
- Intel Xeon Processor E3-1284L v3 with Intel Iris™ Pro Graphics 5200
- Intel Xeon Processor E3-1285 v2 and E3-1285L v2 with Intel HD Graphics P4000

Software

- Microsoft* Windows Server* 2012, Microsoft Windows Server 2012 R2, 64-bit Microsoft Windows* 8 (development only).
- Microsoft Visual C++* 2005 with Service Pack 1, or later version of Microsoft Visual C++.

Note: Other combinations of Microsoft Windows Server 2012 and Intel Core™ based platforms may function using traditional Windows client Intel Iris™ and HD graphics driver. But please be aware that such combinations are neither validated nor supported server platforms by Intel Media SDK for Windows Servers.

Package Contents

Note: The suffix `<arch>` indicates 64-bit Microsoft* Windows* ("`x64`") in this release. 32-bit Windows configuration is excluded compared to Intel® Media SDK 2014 R2 release.

`<install-folder>`	Intel® Media SDK Release Notes (this file), End User License Agreement (EULA) "`Intel Media SDK EULA.rtf`"
`<install-folder>\bin\<arch>`	Intel® Media SDK Dynamic Library, software implementation: `libmfxsw64.dll` for Intel® 64 architecture **Note:** Hardware implementation of Intel Media SDK Dynamic Library `libmfxhw64.dll` is packed and installed with Intel Iris™ and HD Graphics Driver which is a part of the .zip package
`<install-folder>\doc`	Intel® Media SDK documentation: • 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` • Samples Overview `MediaSDK Sample Guide.pdf` • Intel® Media Developer's Guide

	Intel_Media_Developers_Guide.pdf • Intel® Media SDK Library Distribution and Dispatching Process mediasdk-distrib.pdf
<install-folder>\ include	External Intel® Media SDK headers: • Type definitions in mfxdefs.h • Structure definitions in mfxstructures.h • Function definitions in C in mfxvideo.h • C++ wrapper of the SDK functions in mfxvideo++.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>	• Static Dispatcher Library libmfx.lib
<install-folder>\ igfx_s3dcontrol\ include	• S3D API definitions igfx_s3dcontrol.h
<install-folder>\ igfx_s3dcontrol\ lib\<arch>	• Static S3D Control Library igfx_s3dcontrol.lib
<install-folder>\ igfx_s3dcontrol\	• Displaying S3D with Intel® HD Graphics Developers Guide Displaying S3D with Intel HD Graphics.pdf
<install-folder>\ tools\	Contains the following tools in binary form: • 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. • 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.
<install-folder>\ opensource\	Source code of Intel® Media SDK dispatcher

Installation

1. Installation requires full administrative rights.
2. Extract files from the .ZIP file to the target hard drive.
3. Run `MSDKforWinServer2013.msi`.

Known Limitations

The Intel® Media SDK libraries have the following known limitations. Unless explicitly specified each limitation is relevant for both software and hardware implementations of Intel Media SDK dynamic library.

- 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 Intel Media SDK dynamic libraries `libmfxsw64.dll` and `libmfxhw64.dll` not through the dispatcher is unsafe.
- Using the software implementation of 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`.
- `MFX_EXTBUFF_AVC_REFLIST_CTRL` and `MFX_EXTBUFF_CODING_OPTION_SPSPPS` external buffers are not supported by MVC encoder.
- MVC encoder supports `MFX_PROFILE_AVC_STEREO_HIGH` only.
- H.264 encoder in software implementation 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.
- If the MPEG-2 Video encoder `mfxVideoParam::mfxInfoMFX::CodecProfile` is initialized to 0, then the stream will be encoded as `MFX_PROFILE_MPEG2_MAIN`. Additionally if the MPEG-2 Video encoder `mfxVideoParam::mfxInfoMFX::CodecLevel` is initialized to `0`, then the stream will be encoded as `MFX_LEVEL_MPEG2_MAIN`.
- `MFX_FRCALGM_DISTRIBUTED_TIMESTAMP` is unsupported by InverseTelecine and Deinterlace (60i->60p) VPP filters.
- 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 in software implementation 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.
- `MFX_CORRUPTION_ABSENT_TOP_FIELD`, `MFX_CORRUPTION_ABSENT_BOTTOM_FIELD`, `MFX_BITSTREAM_EOS` are not supported by VC-1, MPEG2 Video and JPEG decoders.
- VPP in software implementation always uses simple FRC algorithm based on repeat/drop frames and ignores `MFX_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 in software implementation 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.
- Software implementation doesn't support `mfxExtCodingOption2::MBBRC` and `mfxExtCodingOption2::ExtBRC`.
- Encoders and VPP don't support `mfxExtVppAuxData::PicStruct`.
- VPP scaling in software implementation may produce slightly blurred frames for RGB32 interlaced content.
- `Pitch` value of `mfxFrameData` structure is limited by 65535; therefore maximum width of RGB32 surface is 16383.
- JPEG decoder does not set `Corrupted` flag of `mfxFrameData` structure, and does not accept `MFX_BITSTREAM_EOS` as `DataFlag` of `mfxBitstream` structure.
- MPEG-2 Video decoder returns `MFX_ERR_UNDEFINED_BEHAVIOR` instead of `MFX_ERR_MORE_DATA` when part of sequence header is absent and `MFX_BITSTREAM_COMPLETE_FRAME` flag is set.
- Software implementation doesn't support `mfxExtEncoderCapability`, `mfxExtEncoderResetOption`, `mfxExtAVCEncodedFrameInfo`, `MFX_RATECONTROL_LA` (the look ahead bitrate control algorithm), `mfxExtCodingOption2:: LookAheadDepth` and `mfxExtCodingOption2::Trellis`.
- The look ahead bitrate control mode may produce non HRD compliant encoded streams.
- `VPP::Query` in software implementation mistakenly indicates support for `MFX_FRCALGM_FRAME_INTERPOLATION` while it is actually not available.
- H.264 and MVC encoders may not obey the minimum compression ratio required by the Blu-Ray*/AVCHD* specifications when the requirement is stronger than in H.264 standard.
- When a progressive frame in an interlaced sequence is encoded with `MFX_PICSTRUCT_FIELD_REPEATED` decorative flag pipeline of Decode and VPP will fail with error `MFX_ERR_UNDEFINED_BEHAVIOR` from `VPP::RunFrameVPPAsync`.
- `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 number of internal tasks in hardware implementation is limited to 1024. This imposes a related limitation on the number of Intel Media SDK sessions which depends on the number of components in a session and the asynchronous depth of each component: each component (DECODE, ENCODE or VPP) requires one task for synchronous operation and N tasks for asynchronous operation with depth N.
- 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.

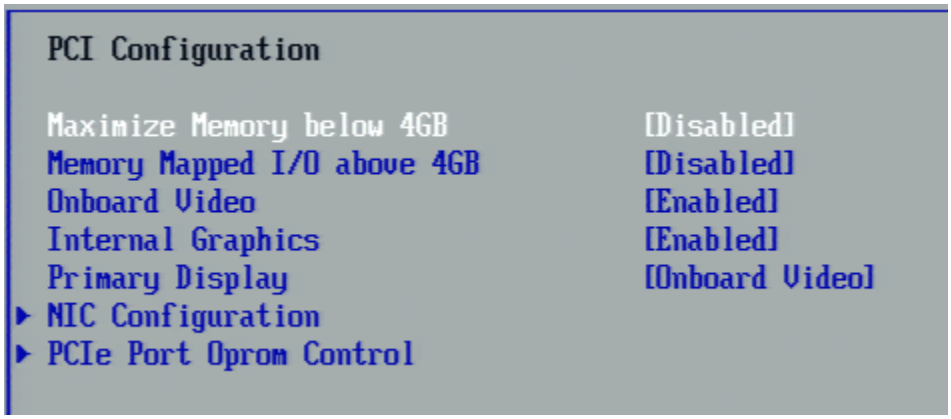
  - MFX_RATECONTROL_LA
  - mfxExtCodingOption2::MBBRC, ExtBRC, LookAheadDepth, Trellis
  - mfxExtEncoderCapability, mfxExtEncoderResetOption, mfxExtAVCEncodedFrameInfo

- 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
  - MFX_RATECONTROL_ICQ, MFX_RATECONTROL_LA_ICQ, MFX_RATECONTROL_VCM
  - mfxInfoMFX::ICQQuality
  - mfxEncodeCtrl::SkipFrame
- The following APIs are not supported by the hardware implementation of Intel Media SDK Library in this release:
  - mfxExtVPPComposite, mfxExtVPPDeinterlacing,
  - mfxExtEncoderROI
  - mfxExtCodingOption2::AdaptiveI, AdaptiveB
  - mfxExtAVCEncodedFrameInfo::MAD, BRCPanicMode, QP
  - MFX_PLUGINID_VP8D_HW
  - MFXVideoENC, mfxENCInput, mfxENCOutput, mfxExtLAControl, mfxExtLAFrameStatistics, RateControlMethod::MFX_RATECONTROL_EXT_LA
  - mfxExtCodingOption2::DisableVUIfields, BufferingPeriodSEI
- MFX_RATECONTROL_VCM mode may not handle bitrate settings correctly and is not HRD compliant. In addition, it doesn't support interlaced encoding and encoding with B frames. Bitrate saving improvement for this BRC mode can be visible for the video sequences with strong temporal correlation such as video conference clips and video scenes with relative static background.
- mfxExtCodingOption2::LookAheadDS currently supports only MFX_LOOKAHEAD_DS_OFF and MFX_LOOKAHEAD_DS_2x, MFX_LOOKAHEAD_DS_4x will give the same result as MFX_LOOKAHEAD_DS_2x. MFX_LOOKAHEAD_DS_OFF is the default value for target usage 1 and 2. MFX_LOOKAHEAD_DS_2x is the default value for target usages 3-7.

- The value reported via `mfxExtEncoderCapability::MBPerSec` may be bigger than the actual maximum processing rate of the encoder.
- This release supports only 64-bit Microsoft* Windows* applications.
- Microsoft DirectX* 11.1 is the only supported acceleration infrastructure (due to headless mode requirement).
- Intel Media SDK Samples: Media framework (Microsoft DirectShow*, Microsoft Media Foundation*) samples are not supported with this release.
- HW HEVC decode plugin will produce artifacts when its output is in system memory or if output is in video memory but further copied to system memory using Microsoft* DirectX* interfaces. A workaround is to insert VPP with video memory input and system memory output after Decode.
- HW HEVC decode plugin is limited to 4096x2304 resolution and doesn't implement SW fallback for higher resolutions. You may use software implementation of HEVC decode from Intel Media SDK HEVC Pack to support higher resolutions.
- HW HEVC decode plugin doesn't support HEVC Main10 profile.

Other Limitations

- For Intel® Server Systems R1304RPMSHOR/ R1208RPMSHOR:
  - Headless mode is supported only with BIOS version 01.03.0004 or later. Download the Intel® Server Board S1200V3RPM Firmware Update Package for EFI at downloadcenter.intel.com (link).
- When Intel HD Graphics is not primary display and not connected to an actual display device make sure to manually enable Internal Graphics in BIOS, see the screenshot below for reference:



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