Intel® Media Server Studio 2015 – Essentials Edition for Linux* Release Notes

Overview

The **Intel® Media Server Studio – Essentials Edition for Linux*** provides software development tools and libraries needed to develop enterprise grade media solutions on Intel® Server Products. The studio is designed for optimizing datacenter and embedded media applications for Linux server operating systems to utilize Intel Iris™ and Intel® HD Graphics hardware acceleration capabilities. The suite includes:

- *Intel® Media Server Studio 2015 – Graphics driver*
- *Intel® Media Server Studio 2015 – SDK*
- *Intel® Media Server Studio 2015 – Samples*

This document covers product features, system requirements and known limitations. For installation procedures description please see the `<unpack-folder>/mediasdk_getting_started_guide.pdf`.

What's New

The Intel® Media Server Studio 2015 – Essentials Edition for Linux* is the first release and includes the following components:

- Intel® Media Server Studio 2015 – Graphics driver, version 16.3.2.22368
- Intel® Media Server Studio 2015 – SDK, version 5.0.1603344.93446
- Intel® Media Server Studio 2015 – Samples, version 5.0.1603344.93446, Samples are part of this package, but they could be downloaded from Media Solutions Portal as well.

Features

Intel® Media Server Studio 2015 (Intel® MSS) – SDK included in this package implements Intel® Media SDK API 1.10 and contains the following components:

Component	Supported features	Limitations
H.264 decoder	Supported Profiles: • Baseline • Main • High	Maximum supported resolution: 4096x2304
H.264 encoder	Supported Profiles: • Baseline • Main • High Supported BRC methods: • Constant QP (CQP) • Constant Bit Rate (CBR) • Variable Bit Rate (VBR) • Look Ahead (LA)	Maximum supported resolution: 4096x2304
MPEG-2 decoder	Supported Profiles: • Simple • Main • High	Maximum supported resolution: 1920x1088
MPEG-2 encoder	Supported Profiles: • Simple • Main • High Supported BRC methods: • Constant QP (CQP) • Constant Bit Rate (CBR) • Variable Bit Rate (VBR)	Maximum supported resolution: 1920x1088
VC1 decoder	Supported Profiles: • Simple • Main	Maximum supported resolution: 1920x1088

	• Advanced	
MJPEG encoder (SW only)	Supported Profiles: • Baseline mode, 8bit	Maximum supported resolution: 8192x8192
MJPEG decoder (SW only)	Supported Profiles: • Baseline mode, 8bit	Maximum supported resolution: 8192x8192
Video Pre Processing (VPP)	Supported Algorithms: • Color Conversion • Scaling • De-Interlacing • De-noising • Frame Rate Conversion • Composition	Maximum supported resolution: 4096x2304

Common for all components: minimum supported resolution is 32x32, frame width must be a multiple of 16, frame height must be a multiple of 16 for progressive frames and a multiple of 32 otherwise.

Please see the Intel® MSS - SDK Reference Manual for details "`<sdk-install-folder>/doc/mediasdk-man.pdf`"

System Requirements

Hardware

The following processor models are supported:

- Intel® Xeon® Processor E3-1285 v3/E3-1285L v3 and E3-1286 v3/E3-1286L v3 with Intel C226 Chipset.
- 4th Generation Intel Core™ Processors with Intel Iris™ Pro Graphics, Intel Iris Graphics or Intel HD Graphics 4200+ Series
- 3rd Generation Intel Core Processors with Intel HD Graphics 4000/2500

Please note: Only the Intel Xeon processor + chipset combinations listed above are supported. Other Intel Xeon configurations are not supported. Intel Core processors earlier than 3rd Generation are not supported. Intel Celeron®, Intel Pentium® and Intel Atom™ processors are also not supported.

Software

- Ubuntu* 12.04 LTS for 64-bit architecture (currently 12.04.3) or SUSE* Linux* Enterprise Server 11 for 64-bit architecture
- Xf86-video-intel driver (needed only for local rendering with LibVA X11 backend support). Recommended version: 2.20.10,

http://cgit.freedesktop.org/xorg/driver/xf86-video-intel/snapshot/xf86-video-intel-2.20.10.tar.gz

- FFmpeg* (needed for the Splitters and Muxers Sample and for the Full Transcoding Sample). Recommended version: 2.1.4, http://www.ffmpeg.org/releases/ffmpeg-2.1.4.tar.bz2
- Additional platform-specific software requirements (X indicates a supported combination – **only these hardware/kernel combinations are supported**):

OS	Ubuntu* 12.04 LTS		SUSE* Linux* Enterprise Server 11
Kernel version	3.2.0-41	3.8.0-23	SP3 3.0.76-11
Intel® Xeon® E3-1285 v3 / 4th Generation Intel Core™		X	X
3rd Generation Intel Core™	X		X

Package Contents

Intel® Media Server Studio 2015 – Essentials Edition for Linux* package includes the following components:

Component	Description
`MediaServerStudioRuntimeSLES2015.rpm` `MediaServerStudioRuntimeUbuntu2015.deb`	Intel® MSS 2015 – Driver & SDK runtime packages
`MediaServerStudioDevSLES2015.rpm` `MediaServerStudioDevUbuntu2015.deb`	Intel® MSS 2015 – Driver & SDK development packages, also include Samples
`MediaServerStudioCommonSLES2015.tar.gz` `MediaServerStudioCommonUbuntu2015.tar.gz`	Intel® MSS 2015 – Driver & SDK full package

`media_studio_2015_essentials_release_notes.pdf`
`Intel(R) Media Server Studio – Essentials Edition EULA.txt`
`redist.txt`
`site_license_materials.txt`
`third_party_programs.txt`
`mediasdk_getting_started_guide.pdf`
	Intel® MSS 2015 – SDK documentation: this file, EULA, EULA's accompanying files, Getting Started Guide

Installation Folders

Intel® MSS 2015 – SDK and Samples install under /opt/intel/mediasdk – this is referenced as <sdk-install-dir> in the remainder of this document.

Component	Description
`<sdk-install-dir>/bin/x64`	Intel® MSS 2015 – SDK Dynamic Library, hardware implementation
`<sdk-install-dir>/doc`	Intel® MSS 2015 – SDK documentation
`<sdk-install-dir>/include`	External Intel® MSS 2015 – SDK headers: • Structure definitions in `mfxstructures.h`, `mfxastructures.h`, `mfxvstructures.h` and `mfxcommon.h` • Audio function definitions in C in `mfxaudio.h` • C++ wrapper for Media SDK audio functions in `mfxaudio++.h` • Type definitions in `mfxdefs.h` • `mfxVideoENC` functions definitions `mfxenc.h` • Extensions for Motion JPEG Video coding options `mfxjpeg.h` • Extensions for standalone Look Ahead algorithm `mfxla.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` • Session management function definitions in `mfxsession.h` • Function definitions in C in `mfxvideo.h` • C++ wrapper of the SDK functions in `mfxvideo++.h`
`<sdk-install-dir>/lib/lin_x64`	Intel® MSS 2015 – SDK Static Dispatcher Library `libmfx.a`
`<sdk-install-dir>/plugins`	Intel® MSS 2015 – SDK plug-ins: • Intel(R) Media SDK H264 Advanced Hardware Encode Plug-in (implements 1:N Look Ahead optimization) • Configuration file

`<sdk-install-dir>/samples`	Intel® MSS 2015 – Samples:
	• Samples build script `build.pl`
	• CMake* configuration file CmakeLists.txt
	• Contains the following source code samples:
	  ○ Intel Media SDK Decoding Sample
	  ○ Intel Media SDK Decoding Sample with VPP
	  ○ Intel Media SDK Encoding Sample
	  ○ Intel Media SDK Full Transcoding Sample
	  ○ Intel Media SDK Transcoding Sample
	  ○ Intel Media SDK Splitters and Muxers Sample
	  ○ Intel Media SDK User VPP Plug-in for rotation
	  ○ Intel Media SDK Video-conferencing Sample
	  ○ Intel Media SDK Video Processing Sample

`<sdk-install-dir>/samples/_bin/x64`	Intel® MSS 2015 – Samples pre-built binaries:
	• Console sample application binaries (DRM): (this is the expected interface for most production applications)
	`sample_*_drm`
	• Console sample application binaries (X11): (X11 mode provided for rendering convenience. It is not expected to be used in production and is not well optimized.)
	`sample_*_x11`

`<sdk-install-dir>/builder`	CMake helper scripts.
`<sdk-install-dir>/opensource`	Source code for the Intel® MSS 2015 – SDK Dispatcher
`<sdk-install-dir>/tools/drmserver`	Intel® Media SDK DRM Authentication Server

As multiple installation layouts of Intel® MSS 2015 – Driver are possible, we provide files description according to the tar.gz packages layout.

The folder, where `MediaServerStudioCommon<OS><version>.tar.gz` package is unpacked, is referenced as `<unpack_folder>/` in the remainder of this document.

Component	Description
`<unpack_folder>/kmd`	Intel® MSS 2015 – Driver KMD binaries and source code
`<unpack_folder>/usr/bin`	Intel® MSS 2015 – Driver utilities
`<unpack_folder>/usr/include`	Intel® MSS 2015 – Driver headers for Direct Rendering Manager (DRM) and Video Acceleration API (VA)
`<unpack_folder>/usr/lib64`	Intel® MSS 2015 – Driver libraries: • UMD • DRM • VA

Documentation

You can find more information on how to use Intel® Media Server 2015 - SDK in the following documentation:

- `<sdk-install-folder>/doc/mediasdk-man.pdf`

  "Intel Media SDK Reference Manual" describes the Intel Media SDK API.

- `<sdk-install-folder>/doc/mediasdkusr-man.pdf`

  "Intel Media SDK Extensions for User-Defined Functions" describes an API extension (aka plug-ins API) that allows seamless integration of user-defined functions in Intel Media SDK pipelines.

- `<sdk-install-folder>/doc/MediaSDK-Sample-Guide.pdf`

  "Intel Media SDK for Linux Servers Sample Guide" describes Samples, requirements, location, how to build and use samples.

- `<sdk-install-folder>/doc/mediasdkjpeg-man.pdf`

  "Intel® Media SDK Reference Manual for JPEG*/Motion JPEG" describes Intel Media SDK API for JPEG* processing.

Known Limitations

This release is subject to the following known limitations:

- **API:**

  Intel® Media SDK API is designed for a range of products. A particular product release may support only a subset of the features of the declared API version. This release has the following API limitations:

  - Only the following features among those introduced in API 1.7 are supported:
    - `RateControlMethod::MFX_RATECONTROL_LA`
    - `mfxExtCodingOption2::LookAheadDepth`
    - `mfxExtCodingOption2::MBBRC`
    - `mfxExtCodingOption2::Trellis`
  - Only the following features among those introduced in API 1.8 are supported:
    - `mfxVideoCodecPlugin`
    - `mfxExtVPPComposite`
    - `mfxExtVPPDeinterlacing`
    - `mfxExtCodingOption2::LookAheadDS`
    - `mfxHandleType::MFX_HANDLE_VA_DISPLAY`
    - `mfxImpl::MFX_IMPL_VIA_VAAPI`
  - Only the following features among those introduced in API 1.9 are supported:
    - `mfxVPPCompInputStream:: LumaKeyEnable, LumaKeyMin, LumaKeyMax, GlobalAlphaEnable, GlobalAlpha, PixelAlphaEnable`
    - `mfxExtAVCRefLists`
    - `mfxExtAVCEncodedFrameInfo::secondFieldOffset`
  - Only the following features among those introduced in API 1.10 are supported:
    - `MFXVideoENC` class of functions
    - `mfxENCInput`
    - `mfxENCOutput`
    - `mfxExtLAControl`
    - `mfxExtLAFrameStatistics`
    - `RateControlMethod::MFX_RATECONTROL_LA_EXT`

  Additionally, all the APIs listed above, except for `mfxVideoCodecPlugin`, `mfxHandleType::MFX_HANDLE_VA_DISPLAY` and `mfxImpl::MFX_IMPL_VIA_VAAPI`, are supported only on Intel Xeon® E3-1200 v3 / 4th Generation Intel Core™ platforms. Make sure to call `Query` functions to check the actual support on particular platform at runtime.

- **Performance:**
  - Advanced De-Interlacing provides better quality but might be slower than BOB DI in some cases. API control `mfxExtVPPDeinterlacing` provides application control of de-interlacing method.
  - Transcoding to H.264 on lower target usages might show worse performance as compared to Intel Media SDK for Linux Servers 2013 R2 on Intel Xeon E3-1200 v3 / 4th Generation Intel Core platforms. This effect is due to several encoding features improving subjective and objective visual quality being enabled by default (multiple reference frames, MBBRC, Trellis).
- **H.264 encode:**
  - Look Ahead BRC may generate non HRD-compliant streams.
  - Careful memory/resource planning is needed when using Look Ahead BRC due to storage of pre-analyzed frames. 1:N and N:N transcoding use cases are especially demanding for memory.
  - Trellis option can be enabled only on lower target usages, on some of those it is enabled by default but can be switched off. Exact implementation details are hidden and may change with time and between platforms. Use of `Query` function to retrieve actual support is strongly recommended.
  - MBBRC option is enabled by default on lower target usages but can be switched off. Exact implementation details are hidden and may change with time and between platforms, so using `Query` function to retrieve actual support is strongly recommended.
- **MPEG-2 encode:**
  - The MPEG-2 encoder is hardware accelerated only on Intel Xeon E3-1285 v3 / 4th Generation Intel Core platforms. On 3rd Generation Intel Core software fallback will be used.
  - The MPEG-2 encoder may produce output that under-runs the MPEG-2 video buffer verifier hypothetical reference decoder model (VBV HRD) on some streams.
- **JPEG/MJPEG decode and encode** support only the below feature set:
  - 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
    - Resolution is not limited to 8192x8192 but wasn't well tested beyond this limit.
- New Decoding with Video Processing Sample under `<sdk-install-folder>/samples/sample_decvpp` is not yet functional.
- Limitations related to source code samples are discussed in their corresponding readme files. See "`<sdk-install-folder>/doc/MediaSDK Sample Guide.pdf`" for an overview of the samples and additional documentation.

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