

# Video Processing (VPP) Sample

---

## Overview

---

**VPP Sample** works with **Intel® Media Server Studio 2016 for Linux**.

It demonstrates how to use the **Intel® Media Server Studio – SDK** (hereinafter referred to as "**SDK**") API to create a simple console application that performs video processing of raw video sequences.

## Features

---

**VPP Sample** supports the following video formats:

Format type	
input (uncompressed)	YV12, NV12, YUY2, RGB4 (RGB 32-bit)
output (uncompressed)	NV12

## Hardware Requirements

---

See <install-folder>\Media Samples Guide.pdf.

## Software Requirements

---

See <install-folder>\Media Samples Guide.pdf.

## How to Build the Application

---

See <install-folder>\Media Samples Guide.pdf.

## Running the Software

---

See <install-folder>\Media Samples Guide.pdf.

The executable file requires the following command-line switches to function properly:

-i <InputYUVFile>	Input uncompressed video file name and path
-o <OutputYUVFile>	Output uncompressed video file name and path
-sw <Width>	Width of source input YUV image
-dw <Width>	Width of destination output YUV image
-sh <Height>	Height of input YUV image
-dh <Height>	Height of output YUV image
-sec <FourCC>	Source Input FourCC

-lib <Type>	Implementation of <b>SDK</b> (hw by default): hw = platform-specific (default) sw = software (should not be set since there is no software implementation on Linux platform)
-extapi	Use RunFrameVPPAsyncEx instead of RunFrameVPPAsync for PTIR (Premium Telecine Interlace Reverser) feature from <b>SDK</b> . For details please refer to <a href="#">media_server_studio_ptir_release_notes.pdf</a>
-p guid	32-character hexadecimal guid for VPP plugin.
-dcc <FourCC>	Destination Output FourCC
-sf <FrameRate>	Frame Rate (frames/second) of input YUV image
-df <FrameRate>	Frame Rate (frames/second) of output YUV image
-scrX <X>	X coordinate of the source image ROI top left corner. 0 by default
-scrY <Y>	Y coordinate of the source image ROI top left corner. 0 by default
-scrW <Width>	Width of the source image ROI rectangle. Source width by default
-scrH <Height>	Height of the source image ROI rectangle. Source height by default
-dcrX <X>	X coordinate of the destination image ROI top left corner. 0 by default
-dcrY <Y>	Y coordinate of the destination image ROI top left corner. 0 by default
-dcrW <Width>	Width of the destination image ROI rectangle. Destination width by default
-dcrH <Height>	Height of the destination image ROI rectangle. Destination height by default
-denoise <Level>	Enable Denoise algorithm. Level is the optional value from the interval [0; 100]
-spic	Source Picture Structure: <ul style="list-style-type: none"> <li>• 0 = Interlaced top field first</li> <li>• 1 = Progressive</li> <li>• 2 = Interlaced bottom field first</li> </ul>
-dpic	Destination Picture Structure: <ul style="list-style-type: none"> <li>• 0 = Interlaced top field first</li> <li>• 1 = Progressive</li> <li>• 2 = Interlaced bottom field first</li> </ul>
-va	Video Analysis (scene change detection): <ul style="list-style-type: none"> <li>• 0 = off</li> <li>• 1 = on</li> </ul>
-composite <ParametersFile>	Composition of several input files in one output. The location of substreams on the primary stream is described in the parameter file. The syntax of the parameters file is: <pre> primarystream=&lt;video file name&gt; width=&lt;input video width&gt; height=&lt;input video height&gt; cropx=&lt;input cropX (def: 0)&gt; copy=&lt;input cropY (def: 0)&gt; cropw=&lt;input cropW (def: width)&gt; croph=&lt;input cropH (def: height)&gt; framerate=&lt;input frame rate (def: 30.0)&gt; fourcc=&lt;format (FourCC) of input video (def: nv12. support   nv12 yuy2)&gt; picstruct=&lt;picture structure of input video,   0 = interlaced top field first </pre>

	<pre> 2 = interlaced bottom field first 1 = progressive (default) dstx=&lt;X coordinate of input video located in the output (def: 0)&gt; dsty=&lt;Y coordinate of input video located in the output (def: 0)&gt; dstw=&lt;width of input video located in the output (def: width)&gt; dsth=&lt;height of input video located in the output (def: height)&gt; stream=&lt;video file name&gt; width=&lt;input video width&gt; ... The parameters file may contain one primary stream (which goes first) and up to 64 substreams. </pre>
-n	The number of frames to process
-detail <Level>	Enable Detail Enhancement algorithm. Level is the optional value from the interval [0; 100]
-pa_hue <Hue>	The hue parameter for the destination video. Hue is the value from the interval [-180.0; 180.0]. 0.0 by default
-pa_sat <Saturation>	The saturation parameter for the destination video. Saturation is the value from the interval [0.0; 10.0]. 1.0 by default
-pa_con <Contrast>	The contrast parameter for the destination video. Contrast is the value from the interval [0.0; 10.0]. 1.0 by default
-pa_bri <Brightness>	Brightness is the value from the interval [-100.0; 100.0]. 0.0 by default
-frc:interp	Enables interpolating frame rate conversion mode (for progressive NV12 streams only)

Below are examples of a command-line to execute **VPP Sample**:

```
$ sample_vpp -sw 352 -sh 144 -scc yv12 -dw 320 -dh 240 -dcc nv12
-nr 0 -i input.yv12 -o output.nv12
```

```
$ sample_vpp -lib hw -scc nv12 -dcc nv12 -composite
parameters.par -o out.yuv
The example of parameters.par:
primarystream=input_720x480.yuv
width=720
height=480
cropx=0
copy=0
cropw=720
croph=480
dstx=0
dsty=0
dstw=720
dsth=480
stream=input_480x320.yuv
width=480
height=320
cropx=0
copy=0
cropw=480
croph=320
dstx=100
dsty=100
dstw=320
```

```
dsth=240
```

Please, also pay attention on “Running the Software” section of <installfolder>/Media Samples Guide.pdf document where you will find important notes on backend specific usage (drm and x11).

## Known Limitations

---

- Streams composition works only on the Intel® Xeon® processor E3-1200 v3 product family with hardware **SDK** library.
- Output cropping may be ignored in streams composition for now.

## Legal Information

---

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS OTHERWISE AGREED IN WRITING BY INTEL, THE INTEL PRODUCTS ARE NOT DESIGNED NOR INTENDED FOR ANY APPLICATION IN WHICH THE FAILURE OF THE INTEL PRODUCT COULD CREATE A SITUATION WHERE PERSONAL INJURY OR DEATH MAY OCCUR.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined." Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information.

The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or by visiting [Intel's Web Site](#).

MPEG is an international standard for video compression/decompression promoted by ISO. Implementations of MPEG CODECs, or MPEG enabled platforms may require licenses from various entities, including Intel Corporation.

Intel, the Intel logo, Intel Core are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

### Optimization Notice

Intel's compilers may or may not optimize to the same degree for non-Intel microprocessors for optimizations that are not unique to Intel microprocessors. These optimizations include SSE2, SSE3, and SSE3 instruction sets and other optimizations. Intel does not guarantee the availability, functionality, or effectiveness of any optimization on microprocessors not manufactured by Intel.

Microprocessor-dependent optimizations in this product are intended for use with Intel microprocessors. Certain optimizations not specific to Intel microarchitecture are reserved for Intel microprocessors. Please refer to the applicable product User and Reference Guides for more information regarding the specific instruction sets covered by this notice.

Notice revision #20110804

---

\* Other names and brands may be claimed as the property of others.

OpenCL and the OpenCL logo are trademarks of Apple Inc. used by permission by Khronos.

Copyright © 2016, Intel Corporation