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AMENDMENT 2
2015-04-01

**Information technology — MPEG video
technologies —**

**Part 4:
Video tool library**

**AMENDMENT 2: FU and FN descriptions
for HEVC**

Technologies de l'information — Technologies vidéo MPEG —

Partie 4: Bibliothèque d'outils vidéo

AMENDMENT 2: Descriptions des FU et FN pour HEVC

Reference number
ISO/IEC 23002-4:2014/Amd.2:2015(E)



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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

Introduction

This amendment specifies FU and FN description for support of HEVC (ISO/IEC 23008-2) Main Profile.

STANDARDSISO.COM : Click to view the full PDF of ISO/IEC 23002-4:2014/Amd 2:2015

Information technology — MPEG video technologies —

Part 4: Video tool library

AMENDMENT 2: FU and FN descriptions for HEVC

Add the end of Clause 2, add the following paragraph:

ISO/IEC 23008-2, *Information technology — High efficiency coding and media delivery in heterogeneous environments — Part 2: High efficiency video coding*

Insert a new Clause 9 and its subclauses, as follows:

9 FUs for HEVC Main Profile

FUs for building an HEVC Main Profile decoder are described in this subclause.

9.1 Syntax Parsing

9.1.1 Algo_SynP

FU Name	Algo_Parser
Description	FU algoParser parses syntax elements needed to decode HEVC Main profile bitstreams.
Profiles@levels supported	HEVC Main Profile
Input	
Name	Token
byte	uint(size=8) token
Output	
Name	Token
CUInfo	uint(size=16) token
IntraPredMode	uint(size= 6) token
SliceAddr	uint(size=16) token
PartMode	uint(size= 4) token
IsPicSlcLcu	uint(size=2) token
LFAcrossSlcTile	uint(size=2) token
TilesCoord	uint(size=16) token
LcuSizeMax	uint(size=8) token
PictSize	uint(size=16) token
Poc	uint(size=16) token
SliceType	uint(size= 2) token
SplitTransform	bool token
TUSize	int(size= 8) token

Coeff	int(size=16) token	
StrongIntraSmoothing	bool token	
DispCoord	uint(size=14) token	
PicSizeInMb	uint(size=9) token	
NumRefIdxLxActive	uint(size= 5) token	
RefPicListModif	uint(size= 4) token	
RefPoc	int(size=16) token	
MvPredSyntaxElem	int(size=16)	
SaoSe	int(size=9) token	
SEI_MD5	uint(size=8) token	
Cbf	bool token	
DBFDisable	bool token	
DbfSe	int(size=8)	
weightedPred	int(size=16) token	
Qp	int(size=8) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpeghe.part2.main.synParser		

9.2 Texture Decoding

9.2.1 IntraPrediction

FU Name	IntraPrediction
Description	FU intraPrediction supports all HEVC intra prediction modes, including all 33 directional modes and the DC and planar modes.
Profiles@levels supported	HEVC Main Profile
Input	
Name	Token
CUIInfo	uint(size=16) token
IntraPredMode	uint(size= 6) token
SliceAddr	uint(size=16) token
PartMode	uint(size= 4) token
PictSize	uint(size=16) token
SplitTransform	bool token
StrongIntraSmoothing	bool token
Sample	uint(size=8) token
TilesCoord	uint(size=16) token
LcuSizeMax	uint(size=8) token
Output	
Name	Token
PredSample	uint(size=8) token
Parameter	

Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.intra		

9.2.2 selectCU

FU Name	selectCU	
Description	Actor selectCU depending on whether the current CU is predicted as intra or inter, the FU adds the residual information to inter or intra prediction.	
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
CUInfo	uint(size=16) token	
InterSample	uint(size=8) token	
IntraSample	uint(size=8) token	
PartMode	uint(size= 4) token	
Output		
Name	Token	
Sample	uint(size=8) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.intra		

9.3 Motion Compensation

9.3.1 InterPrediction

FU Name	InterPrediction
Description	The FU interPrediction computes the interpolated samples for the inter prediction.
Profiles@levels supported	HEVC Main Profile
Input	
Name	Token
CUInfo	uint(size=16) token
IsBiPredOrLx	uint(size=2) token
Mv	int (size=16) token
PartMode	uint(size=4) token
Poc	uint(size=16) token
RefIdx	uint(size=3) token
RefList	int(size=16) token
Sample	uint(size=8) token
SliceType	uint(size=2) token
WeightedPredSe	int (size=16) token
Output	
Name	Token

PredSample	uint(size=8) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegheg.part2.main.inter		

9.3.2 DecodedPictureBuffer

FU Name	DecodedPictureBuffer	
Description	The Decoded Picture Buffer contains all previously decoded pictures needed for prediction or later output.	
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
IsBiPredOrLx	uint(size=2) token	
IsReadOrNewSlc	uint(size=1) token	
Mv	int(size=16) token	
PicSize	uint(size=16) token	
Poc	uint(size=16) token	
PredCuSize	uint(size=7) token	
RpsPoc	int(size=16) token	
Sample	uint(size=8) token	
Output		
Name	Token	
RefSample	uint(size=8) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegheg.part2.main.inter		

9.3.3 GenerateRefList

FU Name	GenerateRefList
Description	This FU generates reference lists l0 and l1.
Profiles@levels supported	HEVC Main Profile
Input	
Name	Token
RefPoc	uint(size=16) token
RefPicListModif	uint(size=4) token
NumRefIdxLXAct	uint(size=8) token
Output	
Name	Token
RefList	int(size=16) token
Parameter	

Name	Description	Range
Package		
package org.sc29.wg11.mpegheg.part2.main.inter		

9.3.4 MvComponentPred

FU Name	MvComponentPred	
Description	This FU reconstructs Motion Vectors for the interpolation process.	
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
CUInfo	uint(size=16) token	
PartMode	uint(size=4) token	
PicSize	uint(size=16) token	
Poc	uint(size=16) token	
RefList	int(size=16) token	
RpsPoc	int(size=16) token	
SliceType	uint(size=2) token	
SyntaxElem	int(size=16) token	
SliceAddr	uint(size=16) token	
TilesCoord	uint(size=16) token	
LcuSizeMax	uint(size=8) token	
Output		
Name	Token	
IsBiPredOrLx	uint(size=2) token	
IsReadOrNewSlice	uint(size=1) token	
Mv	int(size=16) token	
PocRef	int(size=16) token	
PredCuSize	uint(size=7) token	
RefIdx	uint(size=3) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegheg.part2.main.inter		

9.4 Filtering

9.4.1 SaoFilter

FU Name	SaoFilter
Description	This FU implements the Sample Adaptive Offset filtering stage.
Profiles@levels supported	HEVC Main Profile
Input	
Name	Token

IsPicSlcLcu	uint(size=2) token	
LFAcrossSlcTile	uint(size=2) token	
PicSize	uint(size=16) token	
SampleIn	uint(size=8) token	
SaoSe	int(size=9) token	
TilesCoord	uint(size=16) token	
LcuSizeMax	uint(size=8) token	
Output		
Name	Token	
FiltSample	uint(size=8) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpeg.h.part2.main.Filters		

9.4.2 GenerateBs

FU Name	GenerateBs	
Description	This FU generates boundary strength coefficients for the inloop deblocking filter.	
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
Cbf	bool token	
CUInfo	uint(size=16) token	
IsBiPredOrLx	uint(size=2) token	
LFAcrossSlcTile	uint(size=2) token	
Mv	int(size=16) token	
PartMode	uint(size=4) token	
RefPoc	int(size=16) token	
SliceAddr	uint(size=16) token	
SplitTransf	bool token	
TilesCoord	uint(size=16) token	
LcuSizeMax	uint(size=8) token	
Output		
Name	Token	
BS	uint(size=2) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpeg.h.part2.main.Filters		

9.4.3 DeblockingFilter

FU Name	DeblockingFilter
----------------	------------------

Description	This FU implements the deblocking filter for Coding Units.	
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
Bs	uint(size=2) token	
IsPicSlcLcu	uint(size=2) token	
PicSize	uint(size=16) token	
Qp	int(size=8) token	
SampleIn	uint(size=8) token	
DBFDisable	bool token	
DbfSe	int(size=8)	
Output		
Name	Token	
FiltSample	uint(size=8) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpeg4.part2.main.Filters		

9.4.4 QpGen

FU Name	QpGen	
Description	This FU computes the Qp for 8x8, 16x16, 32x32, and 64x64 blocks.	
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
TuSize	int(size=7) token	
Qp	int(size=8) token	
Output		
Name	Token	
Qp	int(size=8) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpeg4.part2.main.Filters		

9.5 MD5 check

9.5.1 MD5SplitInfo

FU Name	MD5SplitInfo
Description	This FU splits the file data into 512 bit units necessary for the MD5 algorithm.
Profiles@levels supported	HEVC Main Profile
Input	

Name	Token	
Byte	uint(size=8) token	
SEI_MD5	uint(size=8) token	
PicSize	uint(size=16) token	
Output		
Name	Token	
DataOut	uint(size=8) token	
Length	uint(size=64) token	
REF_MD5	uint(size=32) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpeg.h.part2.common		

9.5.2 padding

FU Name	padding	
Description	Data padder	
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
LENGTH	uint(size=64) token	
DATA	uint(size=8) token	
Output		
Name	Token	
OUT	uint(size=8) token	
NEWLENGTH	uint(size=32) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpeg.h.part2.common		

9.5.3 MD5Shifter

FU Name	MD5Shifter
Description	Data shifter
Profiles@levels supported	HEVC Main Profile
Input	
Name	Token
IN	uint(size=8) token
Output	
Name	Token
OUT	uint(size=32) token
Parameter	

Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.common		

9.5.4 MD5Compute

FU Name	MD5Compute	
Description	This FU applies the MD5 algorithm and compares it with the MD5 reference key.	
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
IN	uint(size=32) token	
REF	uint(size=32) token	
NEWLENGTH	uint(size=32) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.common		

9.6 Inverse transforms

9.6.1 IT_Splitter

FU Name	IT_Splitter	
Description	This FU splits the residual coefficients depending on the size of the block	
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
coeff	int(size=16) token	
size	int(size=7) token	
Output		
Name	Token	
Coeff_4x4_DST	int(size=16) token	
Coeff_4x4_IT	int(size=16) token	
Coeff_8x8	int(size=16) token	
Coeff_16x16	int(size=16) token	
Coeff_32x32	int(size=16) token	
Coeff_skip	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

9.6.2 IT_Merger

FU Name	IT_Merger	
Description	This FU merges the decoded coefficients of the different IT CU	
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
Size	int(size=8) token	
Block_skip	int(size=16) token	
Block_4x4_DST	int(size=16) token	
Block_4x4_IT	int(size=16) token	
Block_8x8	int(size=16) token	
Block_16x16	int(size=16) token	
Block_32x32	int(size=16) token	
Output		
Name	Token	
Block	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

9.6.3 Block_Merger

FU Name	Block_Merger	
Description	This FU merges the decoded coefficients of the different IT decoding blocks	
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
Size	int(size=8) token	
Block_in	int(size=16) token	
Output		
Name	Token	
Block	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

9.6.4 Transpose_4x4

FU Name	Transpose_4x4
Description	

Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
Src	int(size=16) token	
Output		
Name	Token	
Dst	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

9.6.5 Transpose_8x8

FU Name	Transpose_8x8	
Description		
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
Src	int(size=16) token	
Output		
Name	Token	
Dst	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

9.6.6 Transpose_16x16

FU Name	Transpose_16x16	
Description		
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
Src	int(size=16) token	
Output		
Name	Token	
Dst	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

9.6.7 Transpose_32x32

FU Name	Transpose_32x32	
Description		
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
Src	int(size=16) token	
Output		
Name	Token	
Dst	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegheh.part2.main.IT		

9.6.8 Transpose_32x32

FU Name	Transpose_32x32	
Description		
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
Src	int(size=16) token	
Output		
Name	Token	
Dst	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegheh.part2.main.IT		

9.6.9 IT4x4_1d

FU Name	IT4x4_1d
Description	
Profiles@levels supported	HEVC Main Profile
Input	
Name	Token
Src	int(size=16) token
Output	
Name	Token
Dst	int(size=16) token

Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

9.6.10 IT8x8_1d

FU Name	IT8x8_1d	
Description		
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
Src	int(size=16) token	
Output		
Name	Token	
Dst	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

9.6.11 IT16x16_1d

FU Name	IT16x16_1d	
Description		
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
Src	int(size=16) token	
Output		
Name	Token	
Dst	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

9.6.12 IT32x32_1d

FU Name	IT32x32_1d
Description	
Profiles@levels supported	HEVC Main Profile
Input	
Name	Token

Src	int(size=16) token	
Output		
Name	Token	
Dst	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

9.6.13 invDST4x4_1st

FU Name	invDST4x4_1st	
Description		
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
IN	int(size=16) token	
Output		
Name	Token	
OUT	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

9.6.14 invDST4x4_2nd

FU Name	invDST4x4_2nd	
Description		
Profiles@levels supported	HEVC Main Profile	
Input		
Name	Token	
IN	int(size=16) token	
Output		
Name	Token	
OUT	int(size=16) token	
Parameter		
Name	Description	Range
Package		
package org.sc29.wg11.mpegH.part2.main.IT		

Replace B.1 as follows:

B.1 Value of the RVC descriptions

Value of the RVC descriptions	Description
0x00	Unspecified
0x01	Description of MPEG-4 part 2 SP defined as Top_mpeg4_part2_SP_decoder.xdf
0x02	Description of MPEG4-part 10 CBP defined as Top_mpeg4_part10_CBP_decoder.xdf
0x03	Description of MPEG-4 part 10 PHP defined as Top_mpeg4_part10_PHP_decoder.xdf
0x04 ... 0xFFFF	Reserved
0xFFFF... 0xFFFFFFFF	User defined

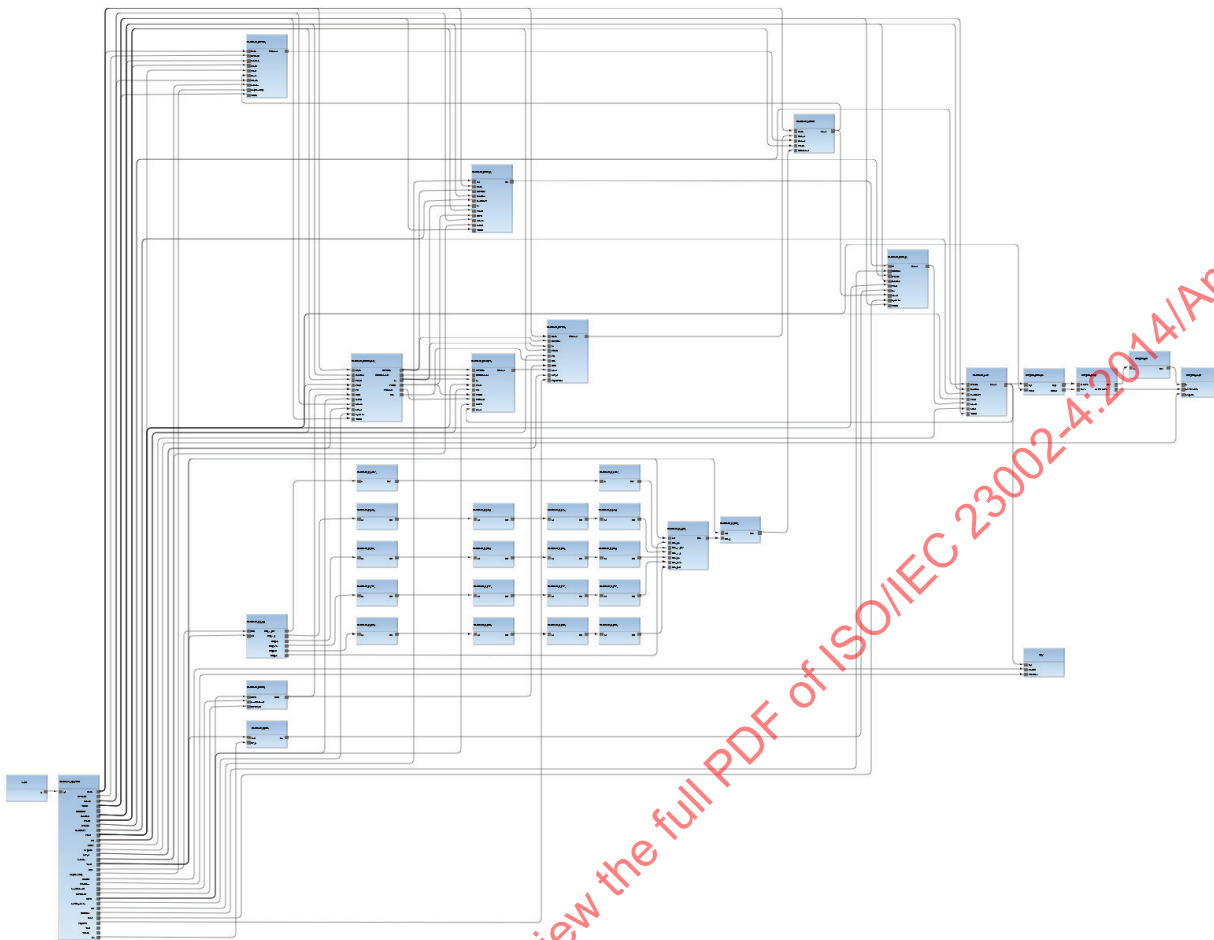
with

B.1 Value of the RVC descriptions

Value of the RVC descriptions	Description
0x00	Unspecified
0x01	Description of MPEG-4 Part 2 Simple Profile defined as Top_mpeg4_part2_SP_decoder.xdf
0x02	Description of AVC (MPEG-4-Part 10) Constrained Baseline Profile defined as Top_mpeg4_part10_CBP_decoder.xdf
0x03	Description of AVC (MPEG-4 Part 10) Progressive High Profile defined as Top_mpeg4_part10_PHP_decoder.xdf
0x04	Description of HEVC (MPEG-H Part 2) Main Profile defined as Top_mpeg4_part10_PHP_decoder.xdf
0x05 ... 0xFFFF	Reserved
0xFFFF... 0xFFFFFFFF	User defined

Add B.4 as follows:

B.4 FNL of HEVC Main Profile



FNL specification of the HEVC Main Profile decoder (Refer to Top_mpeg_h_part2_main_decoder.xdf file)

```
<?xml version="1.0" encoding="UTF-8"?>
<XDF name="Top_mpeg_h_part2_main">
  <Instance id="Source">
    <Class name="org.sc29.wg11.common.SourceTest"/>
  </Instance>
  <Instance id="display">
    <Class name="org.sc29.wg11.common.DisplayYUVWithCrop"/>
    <Parameter name="BLK_SIDE">
      <Expr kind="Literal" literal-kind="Integer" value="16"/>
    </Parameter>
  </Instance>
  <Instance id="HevcDecoder_Algo_Parser">
    <Class name="devel.org.sc29.wg11.mpeg_h.part2.main.synParser.Algo_Parser"/>
  </Instance>
  <Instance id="HevcDecoder_IntraPrediction">
    <Class name="devel.org.sc29.wg11.mpeg_h.part2.main.intra.IntraPrediction"/>
    <Parameter name="EnabSkipInPix">
      <Expr kind="Literal" literal-kind="Boolean" value="false"/>
    </Parameter>
  </Instance>
  <Instance id="HevcDecoder_SelectCU">
    <Class name="devel.org.sc29.wg11.mpeg_h.part2.SelectCu"/>
  </Instance>
  <Instance id="HevcDecoder_DecodedPictureBuffer">
    <Class name="devel.org.sc29.wg11.mpeg_h.part2.main.inter.DecodedPictureBuffer"/>
  </Instance>
  <Instance id="HevcDecoder_InterPrediction">
    <Class name="devel.org.sc29.wg11.mpeg_h.part2.main.inter.InterPrediction"/>
  </Instance>
</XDF>
```

```

</Instance>
<Instance id="HevcDecoder_SAO">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.Filters.SaoFilter"/>
  <Parameter name="DEBUG">
    <Expr kind="Literal" literal-kind="Boolean" value="true"/>
  </Parameter>
</Instance>
<Instance id="HevcDecoder_QpGen">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.Filters.QpGen"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT_Splitter">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.IT_Splitter"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT_Merger">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.IT_Merger"/>
</Instance>
<Instance id="HevcDecoder_xIT_invDST4x4_1st">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.invDST4x4_1st"/>
</Instance>
<Instance id="HevcDecoder_xIT_invDST4x4_2nd">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.invDST4x4_2nd"/>
</Instance>
<Instance id="HevcDecoder_xIT_Block_Merger">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.Block_Merge"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT4x4_IT4x4_1d_0">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.IT4x4_1d"/>
  <Parameter name="shift">
    <Expr kind="Literal" literal-kind="Integer" value="7"/>
  </Parameter>
</Instance>
<Instance id="HevcDecoder_xIT_IT4x4_Transpose4x4_0">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.Transpose4x4"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT4x4_IT4x4_1d_1">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.IT4x4_1d"/>
  <Parameter name="shift">
    <Expr kind="Literal" literal-kind="Integer" value="12"/>
  </Parameter>
</Instance>
<Instance id="HevcDecoder_xIT_IT4x4_Transpose4x4_1">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.Transpose4x4"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT8x8_IT8x8_1d_0">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.IT8x8_1d"/>
  <Parameter name="shift">
    <Expr kind="Literal" literal-kind="Integer" value="7"/>
  </Parameter>
</Instance>
<Instance id="HevcDecoder_xIT_IT8x8_Transpose8x8_0">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.Transpose8x8"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT8x8_IT8x8_1d_1">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.IT8x8_1d"/>
  <Parameter name="shift">
    <Expr kind="Literal" literal-kind="Integer" value="12"/>
  </Parameter>
</Instance>
<Instance id="HevcDecoder_xIT_IT8x8_Transpose8x8_1">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.Transpose8x8"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT16x16_IT16x16_1d_0">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.IT16x16_1d"/>
  <Parameter name="shift">
    <Expr kind="Literal" literal-kind="Integer" value="7"/>
  </Parameter>
</Instance>
<Instance id="HevcDecoder_xIT_IT16x16_Transpose16x16_0">
  <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.Transpose16x16"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT16x16_IT16x16_1d_1">

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    <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.IT16x16_1d"/>
    <Parameter name="shift">
      <Expr kind="Literal" literal-kind="Integer" value="12"/>
    </Parameter>
  </Instance>
  <Instance id="HevcDecoder_xIT_IT16x16_Transpose16x16_1">
    <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.Transpose16x16"/>
  </Instance>
  <Instance id="HevcDecoder_xIT_IT32x32_IT32x32_1d_0">
    <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.IT32x32_1d"/>
    <Parameter name="shift">
      <Expr kind="Literal" literal-kind="Integer" value="7"/>
    </Parameter>
  </Instance>
  <Instance id="HevcDecoder_xIT_IT32x32_Transpose32x32_0">
    <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.Transpose32x32"/>
  </Instance>
  <Instance id="HevcDecoder_xIT_IT32x32_IT32x32_1d_1">
    <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.IT32x32_1d"/>
    <Parameter name="shift">
      <Expr kind="Literal" literal-kind="Integer" value="12"/>
    </Parameter>
  </Instance>
  <Instance id="HevcDecoder_xIT_IT32x32_Transpose32x32_1">
    <Class name="devel.org.sc29.wg11.mpeg.part2.main.IT.Transpose32x32"/>
  </Instance>
  <Instance id="HevcDecoder_DBFilter_DeblockFilt">
    <Class name="devel.org.sc29.wg11.mpeg.part2.main.Filters.DeblockingFilter"/>
    <Parameter name="FILT_HOR_EDGES">
      <Expr kind="Literal" literal-kind="Boolean" value="true"/>
    </Parameter>
    <Parameter name="FILT_VERT_EDGES">
      <Expr kind="Literal" literal-kind="Boolean" value="true"/>
    </Parameter>
    <Parameter name="DEBUG">
      <Expr kind="Literal" literal-kind="Boolean" value="false"/>
    </Parameter>
  </Instance>
  <Instance id="HevcDecoder_DBFilter_GenerateBs">
    <Class name="devel.org.sc29.wg11.mpeg.part2.main.Filters.GenerateBs"/>
  </Instance>
  <Instance id="HevcDecoder_generateInfo_GenerateRefList">
    <Class name="devel.org.sc29.wg11.mpeg.part2.main.inter.GenerateRefList"/>
  </Instance>
  <Instance id="HevcDecoder_generateInfo_MvComponentPred">
    <Class name="devel.org.sc29.wg11.mpeg.part2.main.inter.MvComponentPred"/>
    <Parameter name="FIX_TMVP_REFIDX0">
      <Expr kind="Literal" literal-kind="Boolean" value="true"/>
    </Parameter>
  </Instance>
  <Instance id="MD5_padding">
    <Class name="devel.org.sc29.wg11.mpeg.part2.common.padding"/>
  </Instance>
  <Instance id="MD5_shifter">
    <Class name="devel.org.sc29.wg11.mpeg.part2.common.MD5Shifter"/>
  </Instance>
  <Instance id="MD5_compute">
    <Class name="devel.org.sc29.wg11.mpeg.part2.common.MD5Compute"/>
  </Instance>
  <Instance id="MD5_MD5SplitInfo">
    <Class name="devel.org.sc29.wg11.mpeg.part2.common.MD5SplitInfo"/>
    <Parameter name="BLK_SIDE">
      <Expr kind="Literal" literal-kind="Integer" value="16"/>
    </Parameter>
  </Instance>
  <Connection dst="HevcDecoder_IntraPrediction" dst-port="CUInfo"
    src="HevcDecoder_Algo_Parser" src-port="CUInfo"/>
  <Connection dst="HevcDecoder_IntraPrediction"
    dst-port="IntraPredMode" src="HevcDecoder_Algo_Parser" src-port="IntraPredMode"/>
  <Connection dst="HevcDecoder_IntraPrediction" dst-port="PictSize"
    src="HevcDecoder_Algo_Parser" src-port="PictSize"/>

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