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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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 ISO documents 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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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

This third edition cancels and replaces the second edition (ISO/IEC 23002-4:2014), which has been technically revised.

It also incorporates ISO/IEC 23002-4:2014/Amd.1:2014, ISO/IEC 23002-4:2014/Amd.2:2015, and ISO/IEC 23002-4:2014/DAmd.3[1].

The changes compared to the previous edition are as follows.

— FU description convention described in Clause 4 has been technically updated.

— Functional unit (FU) and FU network (FN) descriptions for graphics tool library (GTL) have been added according to ISO/IEC 23002-4:2014/Amd.1:2014. Clause 5, Clause 9, Annexes D, E, F, and G have been added.

— FU and FN descriptions for high efficiency video coding (HEVC) have been added according to ISO/IEC 23002-4:2014/Amd.2:2015. Clause 10 has been added and Annex B has been updated.

[1] Draft amendment approved in DAM ballot but not published.

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— FU and FN descriptions for parser instantiation from bitstream syntax description (BSD) have added. Clause 5 has updated and Annex I has added.

— A patent statement has been added in Annex H.

A list of all parts in the ISO/IEC 23002 series can be found on the ISO website.

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Introduction

This document defines the MPEG video tool library, which contains tools drawn from existing MPEG coding standards, such as ISO/IEC 14496-2 and ISO/IEC 14496-10, and ISO/IEC 23001-4 defines the methods capable of describing codec configurations in the reconfigurable video coding (RVC) framework.

This document primarily addresses reconfigurable video aspects and will only focus on the description of representation of video codec configurations under the RVC framework, but could be extended to a more generic reconfigurable media coding (RMC) framework.

The objective of RVC is to offer a framework that is capable of configuring and specifying video codecs as a collection of "higher level" modules by using video coding tools. The video coding tools are defined in video tool libraries. This d defines the MPEG video tool library. The RVC framework principle could also support non-MPEG tool libraries, provided that their developers have taken care to obey the appropriate rules of operation.

For the purpose of framework deployment, an appropriate description is needed to describe configurations of decoders composed of or instantiated from a subset of video tools from either one or more libraries. As illustrated in Figure 1, the configuration information consists of

— bitstream syntax description, and

— network of functional units (FUs) description (also referred to as the decoder configuration)

that together constitute the entire decoder description.

Bitstreams of existing MPEG standards are specified by specific syntax structures and decoders are composed of various coding tools. Therefore, RVC includes support for bitstream syntax descriptions as well as video coding tools. As depicted in Figure 1, a typical RVC decoder requires two types of information, namely the decoder description and the encoded media (e.g. video bitstreams) data.

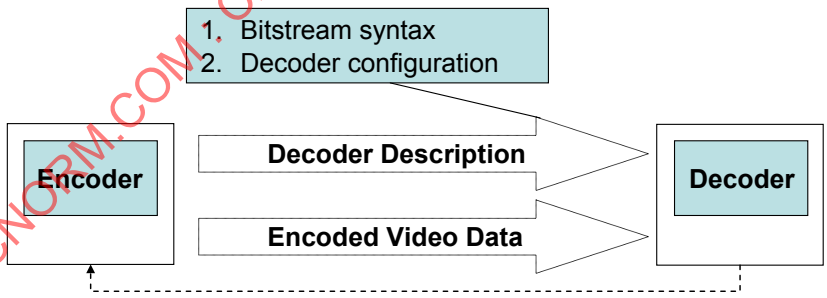

Figure 1 — Conceptual diagram of RVC

A more detailed description of the RVC decoder is illustrated in Figure 2. As shown in Figure 2, the decoder description is required for the configuration of a RVC decoder. The Bitstream Syntax Description (BSD) and FU Network Description (FND) (which compose the Decoder Description) are used to configure or compose an abstract decoder model (ADM) which is instantiated through the selection of FUs from tool libraries optionally with proper parameter assignment. Such ADM constitutes the behavioral reference model used in setting up a decoding solution under the RVC framework. The process of yielding a decoding solution may vary depending on the technologies used for the desired

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implementations. Examples of the instantiation of an ADM and generation of proprietary decoding solutions can be found in ISO/IEC 23001-4.

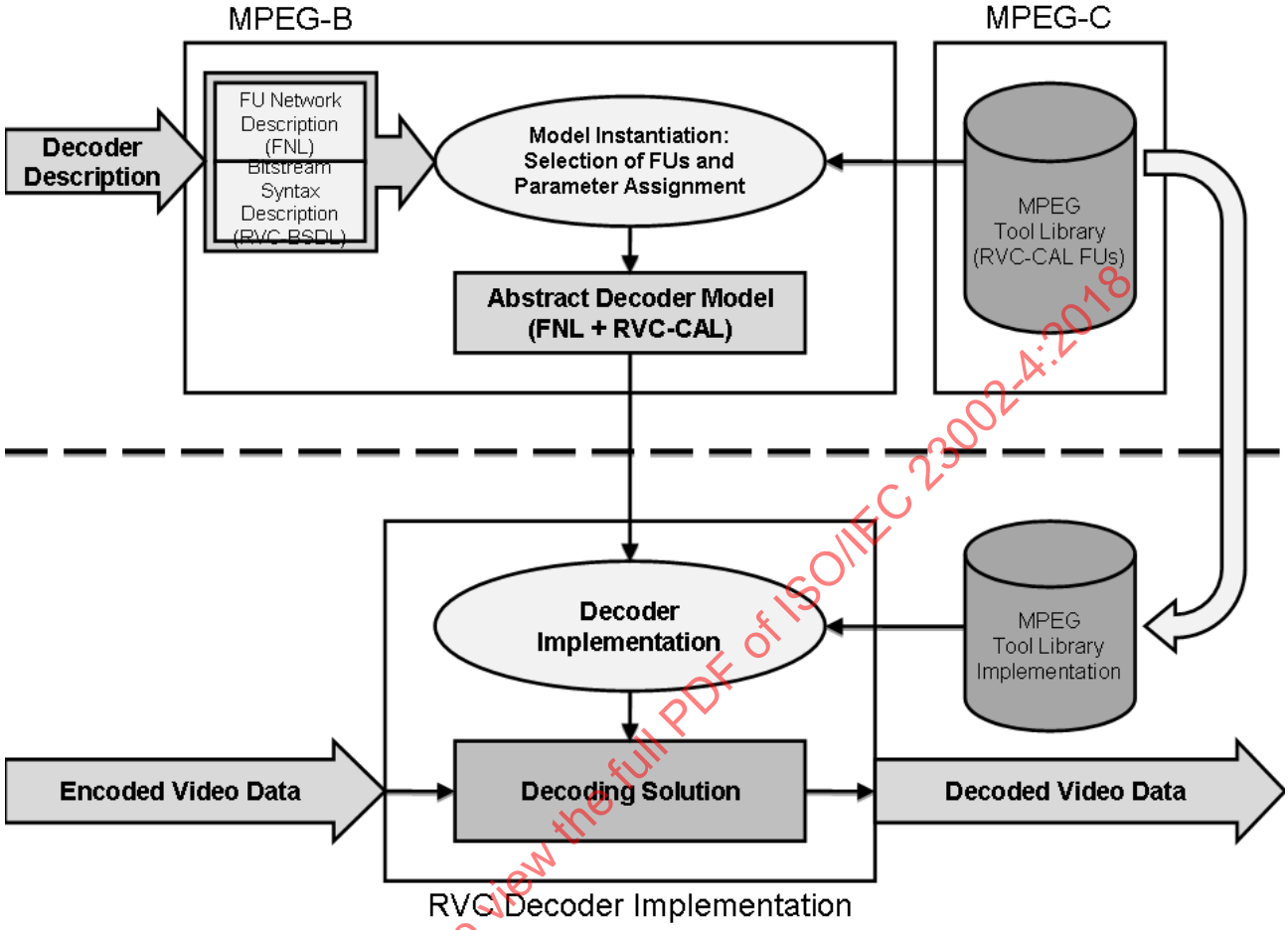

Figure 2 — Graphical representation of the process for setting up a decoding solution under the RVC framework

Within the RVC framework, the decoder description describes a particular decoder configuration and consists of the FND and the BSD. The FND describes the connectivity of the network of FUs used to form a decoder whereas the parsing process for the bitstream syntax is implicitly described by the BSD. These two descriptions are specified using two standard XML-based languages or dialects.

— Functional unit network language (FNL) is a language that describes the FND, known also as "network of FUs". The FNL specified normatively within the scope of the RVC framework is provided in ISO/IEC 23001-4.

— Bitstream syntax description language (BSDL), standardized in ISO/IEC 23001-5 (MPEG-B Part 5), describes the bitstream syntax and the parsing rules. A pertinent subset of this BSDL named RVC-BSDL is defined within the scope of the current RVC framework. This RVC-BSDL also includes possibilities for further extensions, which are necessary to provide complete description of video bitstreams. RVC-BSDL specified normatively within the scope of the RVC framework is provided in ISO/IEC 23001-4.

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The decoder configuration specified using FNL, together with the specification of the bitstream syntax using RVC-BSDL fully specifies the ADM and provides an “executable” model of the RVC decoder description.

The instantiated ADM includes the information about the selected FUs and how they should be connected. As already mentioned, the FND with the network connection information is expressed by using FNL. Furthermore, the RVC framework specifies and uses a dataflow-oriented language called RVC-CAL for describing FUs' behavior. The normative specification of RVC-CAL is provided in ISO/IEC 23001-4. The ADM is the behavioural model that should be referred to in order to implement any RVC conformant decoder. Any RVC compliant decoding solution/implementation can be achieved by using proprietary non-normative tools and mechanisms that yield decoders that behave equivalent to the RVC ADM.

The decoder description, the MPEG tool library, and the associated instantiation of an ADM are normative. More precisely, the ADM is intended to be normative in terms of a behavioural model. In other words, what is normative is the input/output behaviour of the complete ADM, as well as the input/output behaviour of all the FUs that are included in the ADM.

A statement concerning patents is included in Annex H of this document.

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Information technology — MPEG video technologies —

Part 4:
Video tool library

1 Scope

This document defines the description of the MPEG video tool library (VTL) based on the decoder description specified in ISO/IEC 23001-4. This tool library defines the specification of FUs, which are sufficient to build complete decoding solutions according to the following coding standards:

— ISO/IEC 14496-2 (MPEG-4 Simple Profile),

— ISO/IEC 14496-10 (MPEG-4 AVC Constrained Baseline Profile and Progressive High Profile),

— ISO/IEC 14496-16 (MPEG-4 SC3DMC), and

— ISO/IEC 23008-2 (HEVC Main Profile).

The objective of ISO/IEC 23001-4 is to define the general framework principles, and this document defines the MPEG VTL that includes relevant tools (or FUs) from the existing MPEG coding standards. Each FU is defined in the form of a textual description, which can be found in 4.1. The input and output behaviour follows the conventions described in Clause 5, Clause 6, and Clause 7.

This document compliant implementations can be designed using any software or hardware language and components. The reference software for the textual specification of FUs is written in RVC-CAL language of which a formal syntax is provided in ISO/IEC 23001-4.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 14496-2, *Information technology — Coding of audio-visual objects — Part 2: Visual*

ISO/IEC 14496-10, *Information technology — Coding of audio-visual objects — Part 10: Advanced Video Coding*

ISO/IEC 14496-16, *Information technology — Coding of audio-visual objects — Part 16: Animation Framework eXtension (AFX)*

ISO/IEC 23001-4, *Information technology — MPEG systems technologies — Part 4: Codec configuration representation*

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

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 23001-4 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

4 FU description convention

4.1 FU interfaces

As shown in Table 1, each FU is described with the following elements.

— **FU Name**: Name to represent the functional unit in this specification. The name of the FU is normative and follows the naming convention described in Annex A.

— **Description**: Textual explanation to describe the functionality of the FU. The description should be concise. The precise normative behaviour of the algorithm (input/output, timing etc.) is specified by the RVC-CAL reference code in ISO/IEC 23002-4:2014/Amd 1:2014.

— **Profiles@levels supported**: The profiles@level supported for this functional unit. It may append that a given range of values makes the FU behave for a given profile@level and another range of values makes the FU behave for another profile@level.

— **Input**: A token that is entering the FU through the designated input port. The token type refers to the token pool described in 4.3. The "name" field indicates the input port.

— **Output**: A token that is coming out of the FU through the designated output port. The "name" field indicates the output port.

— **Parameter (*optional*)**: Parameters are optionally described to adjust the behaviour of the FU. All the parameters shall be specified with name, description and range.

— In several FU diagrams, the ports are named with a trailing "_i" for the input port type and with a trailing "_o" for the output port type.

— Some FU diagrams contain as well the Finite State Machine diagram. The following conventions apply: INPUT - the action of reading a token or a set of tokens from the input port, OUTPUT - the action of writing the token or a set of tokens to an output port.

— "Parameter" is set at network configuration stage (cannot be changed during the process) and it is characteristic for each FU.

— Token RANGE: describes the mathematical interval for the token value

EXAMPLE

Token RANGE: { 0, 1} – binary value.

Token RANGE: [0 .. N], value ∈ [0, N] – real values, closed interval.

— All the FUs require the data to be in little-endian format.

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Table 1 — Template of description of an FU (example)

FU Name	e.g. Algo_IDCT2D_ISOIEC_23002_1	
Description	e.g. This module computes the 8×8 Inverse Discrete Cosine Transform (IDCT) defined as $f(x,y)=\frac{2}{N}\sum_{u=0}^{N-1}\sum_{v=0}^{N-1}C(u)C(v)F(u,v)\cos\frac{(2x+1)u\pi}{2N}\cos\frac{(2y+1)v\pi}{2N}$ with u, v, x, y = 0, 1, 2, …, N-1 where x, y are spatial coordinates in the sample domain u, v are coordinates in the transform domain $C(u),C(v)=\begin{cases}\frac{1}{\sqrt{2}} & \text{for } u,v=0\\ 1 & \text{otherwise}\end{cases}$ It inputs a list of 64 coefficients and outputs a list of 64 decoded coefficients.	
Profiles@levels supported	e.g. MPEG-4 SP	
Input		
Name	**Token**	
e.g. X	e.g. BLOCK token	
Output		
Name	**Token**	
e.g. Y	e.g. BLOCK token	
Parameter		
Name	**Description**	**Range**

4.2 FU IDs

FU of the specific functionality is identified by its unique identification number. Table 2 lists IDs and names of all FUs in VTL. IDs and names are used in FND to select FUs.

Table 2 — List of FUs and their IDs

ID	FU Name
1	org.sc29.wg11.common.Algo_SynP_Generic
2	org.sc29.wg11.mpeg4.part2.sp.parser.Algo_SynP
3	org.sc29.wg11.mpeg4.part2.sp.parser.Mgnt_BlockExpand
4	org.sc29.wg11.mpeg4.part2.sp.parser.Mgnt_Splitter420B
5	org.sc29.wg11.mpeg4.part2.sp.parser.Mgnt_Splitter420MV
6	org.sc29.wg11.mpeg4.part2.sp.parser.Algo_MVR_MedianOfThreeLeftAndTopAndTopRight
7	org.sc29.wg11.mpeg4.part2.sp.parser.Algo_MVSequence_LeftAndTopAndTopRight
9	org.sc29.wg11.mpeg4.part2.sp.parser.Mgnt_Splitter_420_TYPE
10	org.sc29.wg11.mpeg4.part2.sp.parser.vlc.Algo_VLDtableB6_MPEG4Part2
11	org.sc29.wg11.mpeg4.part2.sp.parser.vlc.Algo_VLDtableB7_MPEG4Part2
12	org.sc29.wg11.mpeg4.part2.sp.parser.vlc.Algo_VLDtableB8_MPEG4Part2
13	org.sc29.wg11.mpeg4.part2.sp.parser.vlc.Algo_VLDtableB12_MPEG4Part2
14	org.sc29.wg11.mpeg4.part2.sp.parser.vlc.Algo_VLDtableB13_MPEG4Part2
15	org.sc29.wg11.mpeg4.part2.sp.parser.vlc.Algo_VLDtableB14_MPEG4Part2

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ID	FU Name
16	org.sc29.wg11.mpeg4.part2.sp.parser.vlc.Algo_VLDtableB15_MPEG4Part2
17	org.sc29.wg11.mpeg4.part2.sp.parser.vlc.Algo_VLDtableB16_MPEG4Part2
18	org.sc29.wg11.mpeg4.part2.sp.parser.vlc.Algo_VLDtableB17_MPEG4Part2
19	org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IQ_QSAndQmatrixMp4vOrH263Scaler
20	org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction.Algo_DCRAddr_ThreeLeftTop_8x8
21	org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction.Algo_DCRAddr_ThreeLeftTop_16x16
22	org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction.Algo_DCRInvPred_CHROMA_8x8
23	org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction.Algo_DCRInvPred_LUMA_16x16
24	org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IS_ZigzagOrAlternateHorizontalVertical_8x8
25	org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IAP_AdaptiveHorizontalOrVerticalPred_8x8
26	org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IAP_AdaptiveHorizontalOrVerticalPred_16x16
27	org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IDCT2D_ISOIEC_23002_1
28	org.sc29.wg11.mpeg4.part2.sp.texture.Mgnt_DCSplit
29	org.sc29.wg11.mpeg4.part2.sp.motion.Mgnt_FB_w_Addess_8x8
30	org.sc29.wg11.mpeg4.part2.sp.motion.Mgnt_FB_w_Addess_16x16
31	org.sc29.wg11.mpeg4.part2.sp.motion.Algo_PictureReconstruction_Saturation
32	org.sc29.wg11.mpeg4.part2.sp.motion.Algo_Interp_HalfpelBilinearRoundingControl
33	org.sc29.wg11.mpeg4.part10.cbp.parser.Algo_NALU
34	org.sc29.wg11.mpeg4.part10.cbp.parser.Algo_SynP
35	org.sc29.wg11.mpeg4.part10.cbp.parser.Algo_BlockExpand
36	org.sc29.wg11.mpeg4.part10.cbp.parser.Algo_BlockSplit
37	org.sc29.wg11.mpeg4.part10.cbp.parser.Algo_IntraPred_Split
38	org.sc29.wg11.mpeg4.part10.cbp.parser.Algo_Parser_I_PCM
39	org.sc29.wg11.mpeg4.part10.cbp.selectMacroblock.Algo_DemuxParserInfoForBlocks_Chroma
40	org.sc29.wg11.mpeg4.part10.cbp.selectMacroblock.Algo_DemuxParserInfoForBlocks_Luma
41	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IS_Zigzag_4x4
42	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_LUMA_IHT1d
43	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4
44	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_LUMA_Reordering
45	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_LUMA_Scaling
46	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_CHROMA
47	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_1d
48	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_Addshift
49	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IntraPred_LUMA_16x16
50	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IntraPred_LUMA_4x4
51	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Merge_4x4_to_16x16

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ID	FU Name
52	org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IQ_QSAndSLAndIDCTScaler_4x4
53	org.sc29.wg11.mpeg4.part10.cbp.Residual.Mgnt_IQ_INTRA16x16
54	org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_Merge_4x4_to_8x8
55	org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_IntraPred_CHROMA
56	org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Intra_16x16
57	org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Intra_4x4
58	org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_IQ_Chroma
59	org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Buffer_Neighbour_FullMb
60	org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Buffer_Neighbour_YxY
61	org.sc29.wg11.mpeg4.part10.cbp. intraPred.Algo_Split_16x16_to_4x4_norasterscan
62	org.sc29.wg11.mpeg4.part10.cbp. intraPred.Algo_Merge_4x4_to_16x16_norasterscan
63	org.sc29.wg11.mpeg4.part10.cbp. interPred.Algo_Interp_Bilinear
64	org.sc29.wg11.mpeg4.part10.cbp. interPred.Algo_Interp_SeparableSixTapQuarterPel
65	org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_Interp_Reord
66	org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_MvLXReconstr
67	org.sc29.wg11.mpeg4.part10.cbp.interPred.Mgnt_DPB
68	org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_MMCO
69	org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_RefIdxtoFrameNum
70	org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_RefList
71	org.sc29.wg11.mpeg4.part10.cbp.interPred.Mgnt_InterPred
72	org.sc29.wg11.mpeg4.part10.cbp.deblockingFilter.Mgnt_DBF_AdaptiveFilter
73	org.sc29.wg11.mpeg4.part10.cbp.deblockingFilter.Algo_DBF_AdaptiveFilter
74	org.sc29.wg11.mpeg4.part10.cbp.display.Mgnt_POC
75	org.sc29.wg11.mpeg4.part10.cbp.display.Mgnt_BufferRender
76	org.sc29.wg11.common.Algo_Add_PixSat
77	org.sc29.wg11.common.Mgnt_Select_MB_4
78	org.sc29.wg11.common.Algo_Byte2bit
79	org.sc29.wg11.common.Algo_Mgnt_Merger420
80	org.sc29.wg11.common. Mgnt_Select_MB_8
81	org.sc29.wg11.mpeg4.part10.cbp.display.Mgnt_Merger420_AVC
82	org.sc29.wg11.mpeg4.part10.php.parser.Algo_SynP
83	org.sc29.wg11.mpeg4.part10.php.parser.Algo_BlockExpand
84	org.sc29.wg11.mpeg4.part10.php.selectMacroblock.Algo_DemuxParserInfoForBlocks_Luma
85	org.sc29.wg11.mpeg4.part10.php.Residual.Algo_IS_Zigzag_8x8
86	org.sc29.wg11.mpeg4.part10.php.Residual.Algo_IQ_QSAndSLAndIDCTScaler_8x8
87	org.sc29.wg11.mpeg4.part10.php.Residual.Algo_IIT_8x8
88	org.sc29.wg11.mpeg4.part10.php.Intrapred.Algo_IntraPred_LUMA_8x8
89	org.sc29.wg11.mpeg4.part10.php.Intrapred.Mgnt_Intra_8x8
90	org.sc29.wg11.mpeg4.part10.php.Residual.Algo_Merge_8x8_to_16x16
91	org.sc29.wg11.mpeg4.part10.php.Residual.Algo_DCR_Hadamard_CHROMA
92	org.sc29.wg11.mpeg4.part10.php.Residual.Algo_DCR_Hadamard_LUMA_Scaling
93	org.sc29.wg11.mpeg4.part10.php.Residual.Algo_IQ_QSAndSLAndIDCTScaler_4x4

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ID	FU Name
94	org.sc29.wg11.mpeg4.part10.php.Intrapred.Algo_Merge_8x8_to_16x16_norasterscan
95	org.sc29.wg11.mpeg4.part10.php.Intrapred.Algo_Split_16x16_to_8x8_norasterscan
96	org.sc29.wg11.mpeg4.part10.php.Residual.Mgnt_I4x4_I8x8_demux
97	org.sc29.wg11.mpeg4.part10.php.Residual.Mgnt_I4x4_I8x8_mux
98	org.sc29.wg11.mpeg4.part10.php.interPred.Algo_GeneratePredWeight
99	org.sc29.wg11.mpeg4.part10.php.interPred.Mgnt_SelectMvpLX
100	org.sc29.wg11.mpeg4.part10.php.interPred.Algo_MvLXReconstr
101	org.sc29.wg11.mpeg4.part10.php.interPred.Algo_MvBuffer
102	org.sc29.wg11.mpeg4.part10.php.interPred.Mgnt_SelectMvpLX
103	org.sc29.wg11.mpeg4.part10.php.interPred.Mgnt_SelectRefIdx
104	org.sc29.wg11.mpeg4.part10.php.interPred.Algo_FrameNumToPocList
105	org.sc29.wg11.mpeg4.part10.php.deblockingFilter.Algo_DBF_AdaptiveFilter
106	org.sc29.wg11.mpeg4.part10.php.deblockingFilter.Algo_MvComponentReorder
107	org.sc29.wg11.mpeg4.part16.Algo_Parser_SC3DMC
108	org.sc29.wg11.mpeg4.part16.Algo_InverseQuantization1D
109	org.sc29.wg11.mpeg4.part16.Algo_InverseQuantizationND
110	org.sc29.wg11.mpeg4.part16.Algo_InversePrediction1D
111	org.sc29.wg11.mpeg4.part16.Algo_InversePredictionND
112	org.sc29.wg11.mpeg4.part16.Algo_ED_AD_StaticBit
113	org.sc29.wg11.mpeg4.part16.Algo_ED_AD_AdaptiveBit
114	org.sc29.wg11.mpeg4.part16.Algo_ED_VLD
115	org.sc29.wg11.mpeg4.part16.Algo_ED_BitPrecision
116	org.sc29.wg11.mpeg4.part16.Algo_ED_AD
117	org.sc29.wg11.mpeg4.part16.Algo_ED_AD_EG
118	org.sc29.wg11.mpeg4.part16.Algo_ContextModeling
119	org.sc29.wg11.mpeg4.part16.Algo_ContextModeling_SVA_nType
120	org.sc29.wg11.mpeg4.part16.Algo_ContextModeling_SVA_Indexes
121	org.sc29.wg11.mpeg4.part16.Algo_ContextModeling_SVA_Vertex_Attribute
122	org.sc29.wg11.mpeg4.part16.Algo_ED_4bitsD
123	org.sc29.wg11.mpeg4.part16.Algo_ED_FixedLength
124	org.sc29.wg11.mpeg4.part16.Algo_LookUpTable1D
125	org.sc29.wg11.mpeg4.part16.Algo_DecodeConnectivity_SVA
126	org.sc29.wg11.mpeg4.part16.Algo_DecodeConnectivity_TFAN
127	org.sc29.wg11.mpeg4.part16.Algo_ExtractMask_SC3DMC
128	org.sc29.wg11.mpeg4.part16.Algo_ExtractFaceDirection_SVA
129	org.sc29.wg11.mpeg4.part16.Algo_simpleMath_2op
130	org.sc29.wg11.mpeg4.part16.Algo_Connectivity_InversePrediction_SVA
131	org.sc29.wg11.mpeg4.part16.Mgnt_Replicate_1_2
132	org.sc29.wg11.mpeg4.part16.Mgnt_Replicate_1_4
133	org.sc29.wg11.mpeg4.part16.Mgnt_Replicate_1_8
134	org.sc29.wg11.mpeg4.part16.Mgnt_MUX_2_1
135	org.sc29.wg11.mpeg4.part16.Mgnt_MUX_4_1
136	org.sc29.wg11.mpeg4.part16.Mgnt_MUX_8_1
137	org.sc29.wg11.mpeg4.part16.Mgnt_DEMUX_1_2
138	org.sc29.wg11.mpeg4.part16.Mgnt_DEMUX_1_4
139	org.sc29.wg11.mpeg4.part16.Mgnt_DEMUX_1_8
140	org.sc29.wg11.mpeg4.part16.Mgnt_ExtractSegment
141	org.sc29.wg11.mpeg4.part16.Mgnt_ProviderValue
142	org.sc29.wg11.mpeg4.part16.Mgnt_RepeatSegment

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ID	FU Name
143	org.sc29.wg11.mpeg4.part16.Mgnt_ExtractBytes
144	org.sc29.wg11.mpeg4.part16.Mgnt_ExtractBits
145	org.sc29.wg11.mpeg4.part16.Mgnt_Provider1D
146	org.sc29.wg11.mpeg4.part16.Mgnt_Provider2D
147	org.sc29.wg11.mpegh.part2.main.intra.selectCU
148	org.sc29.wg11.mpegh.part2.main.inter.Algo_InterPrediction
149	org.sc29.wg11.mpegh.part2.main.inter.Mgnt_DecodedPictureBuffer
150	org.sc29.wg11.mpegh.part2.main.inter.Algo_GenerateRefList
151	org.sc29.wg11.mpegh.part2.main.inter.Algo_MvComponentPred
152	org.sc29.wg11.mpegh.part2.main.Filters.Algo_SaoFilter
153	org.sc29.wg11.mpegh.part2.main.Filters.Algo_GenerateBs
154	org.sc29.wg11.mpegh.part2.main.Filters.Algo_DeblockingFilter
155	org.sc29.wg11.mpegh.part2.main.Filters.Algo_QpGen
156	org.sc29.wg11.mpegh.part2.common.Mgnt_MD5SplitInfo
157	org.sc29.wg11.mpegh.part2.common.Mgnt_padding
158	org.sc29.wg11.mpegh.part2.common.Mgnt_MD5Shifter
159	org.sc29.wg11.mpegh.part2.common.Mgnt_MD5Compute
160	org.sc29.wg11.mpegh.part2.main.IT.Mgnt_IT_Splitter
161	org.sc29.wg11.mpegh.part2.main.IT.Mgnt_IT_Merger
162	org.sc29.wg11.mpegh.part2.main.IT.Mgnt_Block_Merger
163	org.sc29.wg11.mpegh.part2.main.IT.Mgnt_Transpose_4x4
164	org.sc29.wg11.mpegh.part2.main.IT.Mgnt_Transpose_8x8
165	org.sc29.wg11.mpegh.part2.main.IT.Mgnt_Transpose_16x16
166	org.sc29.wg11.mpegh.part2.main.IT.Mgnt_Transpose_32x32
167	org.sc29.wg11.mpegh.part2.main.IT.Mgnt_Transpose_32x32
168	org.sc29.wg11.mpegh.part2.main.IT.Algo_IT4x4_1d
169	org.sc29.wg11.mpegh.part2.main.IT.Algo_IT8x8_1d
170	org.sc29.wg11.mpegh.part2.main.IT.Algo_IT16x16_1d
171	org.sc29.wg11.mpegh.part2.main.IT.Algo_IT32x32_1d
172	org.sc29.wg11.mpegh.part2.main.IT.Algo_invDST4x4_1st
173	org.sc29.wg11.mpegh.part2.main.IT.Algo_invDST4x4_2nd

4.3 Token pool

Every token is listed in the "token pool" that is the table of managing all tokens used in VTL. To facilitate the feasibility of connections among input and output ports of different FUs described in this specification, Table 3 lists all data elements (called "token", which is used throughout this document). The ID field here is informative and used for easy lookup.

Table 3 — List of all token types that are used in the descriptions of FUs in this subclause

ID & Name	Description
1 BIT	Token which value is 0 or 1. The bits belongs to the non-decoded bitstream.
2 ACKNOWLEDGMENT	Boolean token (True or False) indicating a acknowledgment. True means it is ok, False, not ok.
3 MCBPC	Token representing the MCBPC element of syntax
4 CBPY	Token representing the CBPY element of syntax
5 DCT_DC_SIZE	Token representing the element of syntax DCT_DC_SIZE
6 DCT_DC_DIFF	Token representing the element of syntax DCT_DC_DIFF

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ID & Name	Description
7 RUN	Token representing the RUN value in the decoding of the DCT coefficients
8 VALUE	Token representing the VALUE value in the decoding of the DCT coefficients
9 LAST	Token representing the LAST value in the decoding of the DCT coefficients
10 MEM_ADDRESS	Token representing an address in the memory of the frames
11 MEM_WIDTH	Token representing the width in pixel of the data to read or write in the memory of the frames starting from the MEM_ADDRESS information
12 MEM_HEIGHT	Token representing the height in pixel of the data to read or write in the memory of the frames starting from the MEM_ADDRESS information
13 MEM_DATA	Token representing a data stored in the memory of the frames
14 WIDTH	Token representing the width value of video frame in pixels
15 HEIGHT	Token representing the height value of video frame in pixels
16 SIZE	Token representing the size of the current frame in number of macroblock in width and number of macroblock in height
17 DC	Tokens representing the DC coefficients. Each token represent one coefficient
18 AC	Token representing AC coefficients without DC coefficients
19 BLOCK	Token representing BLOCK that consists of 8×8 pixels
20 MB	Token representing a macroblock that consists of BLOCKs
21 MVD	Tokens representing the motion vector differences decoded by the syntax parsing process
22 MV	Tokens representing the coordinates of the motion vectors
23 QUANT	Token representing the QUANT value of quantization
24 COORDINATE	Token representing coordinates of block or macroblocks
25 DISPLACEMENT	Token representing the displacement between pixels (e.g., half- or quarter-pixel)
26 SIGN	Token representing a sign.
27 ROUND	Boolean token (True or False) indicating whether rounding is to be made or not
28 BTYPE	Integer token (2 = INTRA), (1 = INTER), (15 = NEW VOP)
29 ACCODED	Boolean token (True or False) indicating whether AC is coded or not
30 ACPRED	Boolean token (True or False) indicating whether AC prediction is made or not
31 ACPRED_DIR	Token representing the order of prediction of the AC coefficients
32 MOTION	Boolean token (True or False) indicating whether motion predication is made or not
33 FOURMV	Boolean token (True or False) indicating whether FOURMV is to be used or not

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ID & Name	Description
34 F_CODE	Token representing a value of FCODE of VOP to specify the range of motion vectors
35 RBSP	Token representing the data in the Raw Byte Sequence Payload
36 NAL_SIZE	Token representing the size in byte of a Network Abstraction Layer unit
37 SUB_MB_TYPE	Token representing sub mb type value for sub partition
38 FRAME_NUM	Token representing the frame number of the current picture to decode
39 FRAME_TO_READ	Token representing the frame to read
40 PART_SIZE	Token representing the size in pixel for a partition of a macroblock, first the width of the partition, then the height
41 REF_ID	Token representing the identification of the decoded reference frame in memory
42 MB_ID	Token representing the number wich identified a macroblock in a frame in position x and y. The macroblocks are counted in a frame using raster scan order.
43 POC	Token representing the index of the frame to display
44 REF_ORDER	Token representing the index of frames to store into long frame reference and short terme reference
45 MMCO	Token representing the order of the index for frame to store in memory
46 PRED_MODE_INTRA	Token representing the prediction mode of an intra macroblock
47 MB_TYPE	Token representing the type of prediction used by a macroblock (Intra, Intra 4×4, Inter, new frame IDR, non IDR or new slice)
48 SLICE_DBF_PARAM	Tokens representing for each slice if deblocking filter is enabled and the offset used in accessing the α and tC0 deblocking filter tables for filtering operations and the offset used in accessing the β deblocking filter table for filtering operations for each slice
49 MB_DBF_PARAM	Tokens representing for each MB the offset used in accessing the β deblocking filter table for filtering operations
50 CBP_BLK	Token representing which of the sixteen 4×4 luma blocks of a macroblock may contain non-zero transform coefficient levels
51 SELECT	Token representing which blocks will selected (from 0-3)
52 ST_LIST	Token representing the short term reference list
53 ST_LIST_SZ	Token representing the size of the short term reference list
54 DEL_LIST	Token representing the list of reference frames that have to be deleted
55 BOOLEAN	Token which value is 0 or 1
56 SIGN	Token which value is 0 or 1
57 FLAG	Token which value is 0 or 1
58 UINT_2	Unsigned integer on 2 bits
59 UINT_4	Unsigned integer on 4 bits

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ID & Name	Description
60 UINT_8	Unsigned integer on 8 bits
61 UINT_16	Unsigned integer on 16 bits
62 UINT_32	Unsigned integer on 32 bits

4.4 Array data order

— **Row based:** The data is processed or sent in a sequential order, row by row.

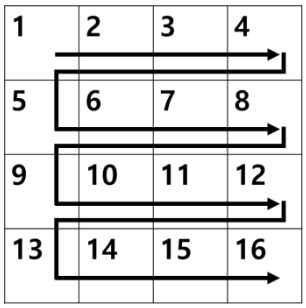

Figure 3 — Example of row-based array data order

— **Column based:** The data is processed or sent in a sequential order, column by column.

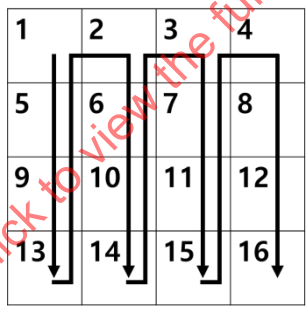

Figure 4 — Example of column-based array data order

4.5 Input ports (reset_i, init_i, start_i)

An FU does not have an outside synchronization signal or synchronization mechanism. These ports are used for the purpose of changing the values of the local variables to default or initialization values.

4.6 FU block diagram notations

The notation [EMBED] defines a part of the main FSM schematic that is described as a separate schematic (for complexity reasons). The [EMBED] schematic is an integrated part of the main FSM schematic.

The notation [MODULE] defines a part of the main FSM schematic that is defined as a separate FU. The module schematic is integrated in the main schematic with the entire FU logic, except the “START” FSM state. The INPUT/OUTPUT states do not read or write values from the ports, they refer to local variables relative to the FU that embeds the other schematic.

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4.7 Conventions

The significance of the "sign" port values is:

Value	Significance
0	negative
1	positive

The significance of the "flag" values is:

Value	Significance
0	false
1	true

4.8 Granular FU

When a decoder is implemented using the FUs, two or more instances of FUs can be grouped and can be dealt as a single instance of FU with bigger granularity. This is called Granular FU, and the use of Granular FU during implementation is normatively allowed. More detailed description about Granular FU concept is given in Annex D, and informative examples of Granular FU can be found from Annex E.

5 General-purpose FUs

5.1 Syntax parsing

5.1.1 Generic syntax parser

FU Name	Algo_SynP_Generic	
Description	This is a generic syntax parser that needs BSD as an input. Input and output port will be defined as the information in the BSD.	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
Output		
Name	**Token**	
Parameter		
Name	**Description**	**Range**

5.1.2 Algo_Byte2bit

FU Name	Algo_Byte2bit	
Description	This module will take 8 bits in once and will output them one by one.	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
BYTE	BIT token	
Output		
Name	**Token**	
BITS	BIT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.common		

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5.1.3 Mgnt_Select_MB_4

FU Name	Mgnt_Select_MB_4	
Description	This module selects data from one of its 4 inputs and sends it to its output (X) according to select information.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
IN_0	MB token	
IN_1	MB token	
IN_2	MB token	
IN_3	MB token	
SELECT	SELECT token	
Output		
Name	**Token**	
OUT	MB token	
Parameter		
Name	**Description**	**Range**
MB_WIDTH	Size in pixel of a macroblock	[8;16]
Package		
package org.sc29.wg11.common		

5.1.4 Mgnt_Merger420

FU Name	Mgnt_Merger420	
Description	This module merges data from YUV to compose a MB 16×16.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
Y	BLOCK token	
U	BLOCK token	
V	BLOCK token	
Select	SELECT token	
Output		
Name	**Token**	
YUV	MB token	
Parameter		
Name	**Description**	**Range**
MB_WIDTH	Size in pixel of a macroblock	[8;16]
Package		
package org.sc29.wg11.common		

5.1.5 Mgnt_Select_MB_8

FU Name	Mgnt_Select_MB_8
Description	This module selects data from one of its 8 inputs and sends it to its output according to select information.
Profiles@levels supported	MPEG-4 AVC Constrained BP

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Input		
Name	**Token**	
IN_0	MB token	
IN_1	MB token	
IN_2	MB token	
IN_3	MB token	
IN_4	MB token	
IN_5	MB token	
IN_6	MB token	
IN_7	MB token	
SELECT	SELECT token	
Output		
Name	**Token**	
OUT	MB token	
Parameter		
Name	**Description**	**Range**
MB_WIDTH	Size in pixel of a macroblock	[8;16]
Package		
package org.sc29.wg11.common		

5.1.6 Mgnt_SynP_DEMUX

FU Name	Mgnt_SynP_DEMUX	
Description	This DEMUX FU can be used to distribute serialized output through a number of different output ports. A potential use of this FU is distribution of output tokens derived from the generic syntax parser FU with serial output. The value of PORT_ID is used to designate the output port which the data from PORT_DATA will be sent. The output port will be defined as the information in the BSD or the FN. NOTE FU descriptions for the Informative examples of this FU can be found in Annex I.	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
PORT_ID	BIT token	
PORT_DATA	BIT token	
Output		
Name	**Token**	
Parameter		
Name	**Description**	**Range**

5.1.7 Mgnt_SynP_BytePreprocessor

FU Name	Mgnt_SynP_BytePreprocessor
Description	This FU pre-processes the input bitstream to remove the emulation prevention codes (i.e. decodes NAL RBSP structure). The output of this FU is a raw encoded video bistream.
Profiles@levels supported	HEVC Main Profile
Input	
Name	**Token**
BITS_IN	BIT token

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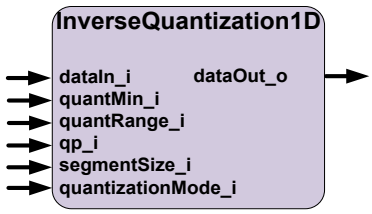
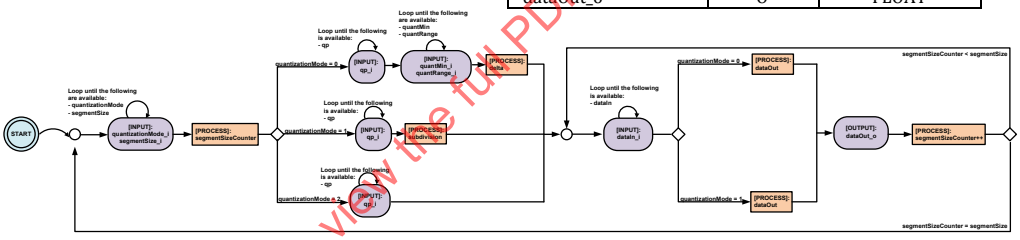
Output		
Name	**Token**	
BITS_OUT	BIT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpegh.part2.main.synParser		

5.2 General processing FUs

5.2.1 Algo_InverseQuantization1D

FU Name	Algo_InverseQuantization1D

Description	
	
	Port Name / Direction (I/O) / Token TYPE
	dataIn_i / I / INT8, INT16, INT32, INT64
	qp_i / I / UINT_32
	quantMin_i / I / FLOAT
	quantRange_i / I / FLOAT
	segmentSize_i / I / UINT8, UINT16, UINT32, UINT64
	quantizationMode_i / I / UINT_2
	dataOut_o / O / FLOAT
	 
	
	Inverse Quantization Process:
	START:
	INPUT_SEGMENT_PARAM:
	INPUT:
	quantizationMode
	segmentSize
	SegmentSizeCounter = 0
	IF quantizatioMode = 0
	INPUT:
	qp
	quantMin
	quantRange
	IF (quantRange > 0.0)
	delta = ((1 << qp) - 1) / quantRange
	ELSE
	delta = 1.0
	IF quantizationMode = 1
	INPUT:
	qp
	INPUT_DATA_IN:
	INPUT:
	dataIn
	IF quantizatioMode = 0
	PROCESS:
	dataOut = quantMin + (dataIn / delta)
	IF quantizatioMode = 1
	PROCESS:
	dataOut = dataIn / qp
	OUTPUT
	dataOut
	SegmentSizeCounter ++

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IF SegmentSizeCounter < segmentSize
    GOTO INPUT_DATA_IN
ELSE
    GOTO INPUT_SEGMENT_PARAM

The following table contains the quantization types index used in the Inverse Quantization 1D FU:

Name of quantization mode	Value
Uniform Quantization	**0**
Uniform Texture Quantization	**1**

The "Inverse Quantization" is an algorithm (step by step procedures) that allows a set of data to be represented with a limited set of values that are associated with its nearest representative.
For a number of "segmentSize" of input data (dataIn), it uses the same set of quantMin, quantRange and quantValue to produce a set of output data (dataOut) of size "segmentSize".

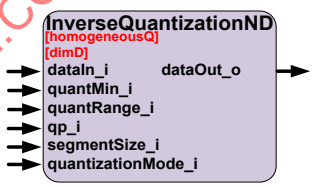
ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)

Input	
Name	**Token**
dataIn_i	INT8, INT16, INT32, INT64
qp_i	UINT_32
quantMin_i	FLOAT
quantRange_i	FLOAT
segmentSize_i	UINT8, UINT16, UINT32, UINT64
quantizationMode_i	UINT_2
Output	
Name	**Token**
dataOut_o	FLOAT
Package	
package org.sc29.wg11.mpeg4.part16	

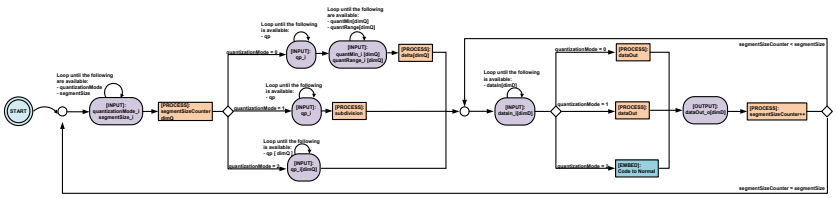
5.2.2 Algo_InverseQuantizationND

FU Name: Algo_InverseQuantizationND

Description



Port Name	Direction (I/O)	Token TYPE
dataIn_i	I	INT8, INT16, INT32, INT64
qp_i	I	UINT_32
quantMin_i	I	FLOAT
quantRange_i	I	FLOAT
segmentSize_i	I	UINT8, UINT16, UINT32, UINT64
quantizationMode_i	I	UINT_2
dataOut_o	O	FLOAT



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Inverse Quantization Process:

$$dimQ = \begin{cases} dimD, if\ homogeneousQ = 0 \\ 1, if\ homogeneousQ = 1 \end{cases}$$

```
START:
INPUT_SEGMENT_PARAM
INPUT:
        quantizationMode
        segmentSize
SegmentSizeCounter = 0
IF quantizatioMode = 0
    INPUT:
        qp
        quantMin [ dimQ ]
        quantRange [ dimQ ]
    WHILE dimQ_counter < dimQ
        IF ( quantRange [ dimQ_counter ] > 0.0 )
            delta [ dimQ_counter ] = ( ( 1 << qp ) - 1 ) / quantRange [ dimQ_counter ]
        ELSE
            delta [ dimQ_counter ] = 1.0;
        dimQ_counter++
IF quantizationMode = 1
    INPUT:
        Qp [ dimQ ]
IF quantizationMode = 2
    INPUT:
        qp
    PROCESS:
        Subdivision = (qp  - 3) / 2

INPUT_DATA_IN:
INPUT:
    dataIn [ dimQ ]
IF quantizatioMode = 0
    PROCESS:
        dataOut = quantMin [ segmentSizeCounter%dimD ] + (dataIn / delta [segmentSizeCounter%dimD])
IF quantizatioMode = 1
    PROCESS: EMBED Code 2 Normal
IF quantizatioMode = 2
    PROCESS:
        dataOut =  dataIn / qp [ segmentSizeCounter % dimD ]
OUTPUT
    dataOut
SegmentSizeCounter ++
IF SegmentSizeCounter < segmentSize
    GOTO INPUT_DATA_IN
ELSE
    GOTO INPUT_SEGMENT_PARAM


EMBED: Code 2 Normal
    Mask = ( 1 << ( 2 * subdivision) ) - 1
    tricode = data & mask;

    // Find y coordinate by solving 2nd degree equation
    factor = 1 << subdivision
    y = factor - sqrt ( (factor^2) - tricode )
    tricode = tricode + ( y * ( y - (2 * factor) ) )
    x = tricode / 2
    upsideDown = tricode % 2

    // Calculate coordinates for all vertices in triangle
    v1x = x + upsideDown
    v1y = y + upsideDown
    v2x = x + 1
    v2y = y
    v3x = x
    v3y = y + 1

    // Calculate coordinates of barycenter
    invMaxCoord = 1 / factor
    normal [ 0 ] = (v1x + v2x + v3x) * invMaxCoord
```

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```
normal [ 1 ] = (v1y + v2y + v3y) * invMaxCoord
normal [ 2 ] = 3 - normal [ 0 ] - normal [ 1 ]

// Flip component signs if necessary
octantCode = ( data >> 2 * subdivision ) & 0x7
if  (octantCode & 0x4)
      normal [ 0 ] = (-1) * normal [ 0 ]
if (octantCode & 0x2)
      normal [ 1 ] = (-1) * normal [ 1 ]
if (octantCode & 0x1)
      normal [ 2 ] = (-1) * normal [ 2 ]

invNorm:= 1 / sqrt ( (normal[ 0 ])² + (normal [ 1 ])² + (normal [ 2 ])² );

//Write the 3 output values
normal [ 0 ] = normal [ 0 ] * invNorm
normal [ 1 ] = normal [ 1 ] * invNorm
normal [ 2 ] = normal [ 2 ] * invNorm

dataOut = normal
```

The following table contains the quantization types index used in the Inverse Quantization ND FU:

Name of quantization mode	Value
Uniform Quantization	**0**
Normal Quantization	**1**
Uniform Texture Quantization	**2**

The "Inverse Quantization" is an algorithm (step by step procedures) that allows a set of data to be represented with a limited set of values that are associated with its nearest representative.
For a number of “segmentSize” x “dimD” of input data (dataIn), it uses the same set of quantMin, quantRange and quantValue of size “dimD” to produce a set of output data (dataOut) of size segmentSize” x “dimD”.
For each set of size “dimD” of input data (dataIn) it uses the corresponding value of quantMin, quantRange and quantValue.

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)

Input

Name	Token
dataIn_i	INT8, INT16, INT32, INT64
qp_i	UINT_32
quantMin_i	FLOAT
quantRange_i	FLOAT
segmentSize_i	UINT8, UINT16, UINT32, UINT64
quantizationMode_i	UINT_2

Output

Name	Token
dataOut_o	FLOAT

Parameter

Name	Description	Type/range
dimD	Describes the number of tokens of type dataIn_i that are consumed at each firing. This parameter is set at the network configuration level.	Type: Integer Range: [1 .. 2^5]
homogeneousQ	Describes the number of tokens of type quantRange_i, quantMin_i and quantValue_i that are necessary for the inverse quantization process. This parameter is set at the network configuration level. The number of tokens is equal to dimD if this parameter is 0 and the number of tokens is equal to 1 if this parameter is 1	Type: Boolean Range: {0,1}

Package

package org.sc29.wg11.mpeg4.part16

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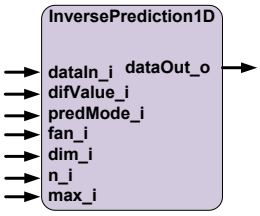
5.2.3 Algo_InversePrediction1D

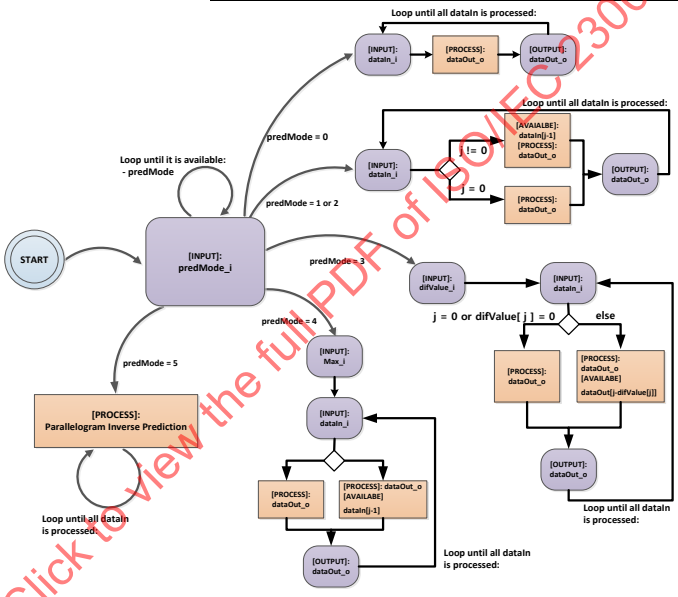
FU Name: Algo_InversePrediction1D

Description

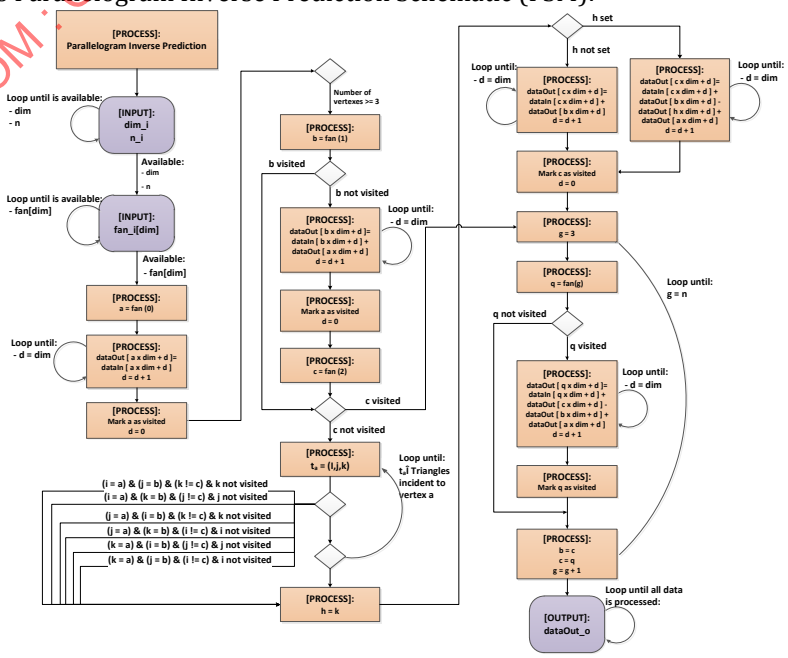
This FU allows five modes of inverse prediction. Not all the ports are used for each prediction mode. This FU can handle one input token at a time.



Port Name	Direction (I/O)	Token TYPE
dataIn_i	I	INT8, INT16, INT32, INT64
difValue_i	I	INT8, INT16, INT32, INT64
predMode_i	I	UINT_4
fan_i	I	INT8, INT16, INT32, INT64
dim_i	I	UINT8, UINT16, UINT32, UINT64
n_i	I	INT8, INT16, INT32, INT64
max_i	I	UINT8, UINT16, UINT32, UINT64
dataOut_o	O	INT8, INT16, INT32, INT64



Process Parallelogram Inverse Prediction Schematic (FSM):



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Inverse Prediction Process:

Switch (predMode)
{

Case 0: NP – No Prediction

$$dataOut[j] = dataIn[j], \qquad \forall j \in \{0 \,..\, N-1\}$$

Case 1: Diff – Differential Prediction

$$dataOut[j] = \begin{cases} dataIn[j], \forall j \in 0 \\ dataIn[j] + dataOut[j-1], \forall\, j \in \{1 \,..\, N-1\} \end{cases}$$

Case 2: XOR – based prediction

$$dataOut[j] = \begin{cases} dataIn[j], \forall j \in 0 \\ dataIn[j] \otimes dataOut[j-1], \forall\, j \in \{1 \,..\, N-1\} \end{cases}$$

Case 3: Adaptive Prediction

$$dataOut[j] = \begin{cases} dataIn[j], if\ difValue[j] = 0\ or\ j = 0 \\ dataIn[j] + dataOut[j - difValue[j]], otherwise \end{cases}$$

Case 4: Circular Differential Prediction

$$dataOut[j] = \begin{cases} dataIn[j], \forall j \in 0 \\ d, if\ dataIn[j] < dataIn[j-1], where\ d = (\ldots) \\ -d, otherwise \end{cases}$$

$$d = \begin{cases} dataIn[j-1] + M_d - dataIn[j], if\ dataIn[j] > dataIn[j-1] \\ dataIn[j] + M_d - dataIn[j-1], otherwise \end{cases}$$

Case 5: Parallelogram Inverse Prediction

```
a = fan ( 0 )
if a not visited
    d = 0
    WHILE d < dim
        dataOut [ a x dim + d ] = dataIn [ a x dim + d ]
        d = d + 1
    Mark a as visited
If number of vertexes > 3
    b = fan ( 1 )
    if b not visited
        d = 0
        WHILE d < dim
            dataOut [ b x dim + d ] = dataIn [ b x dim + d ] + dataOut  [ a x dim + d ]
            d = d + 1
        Mark b as visited
    c = fan ( 2 )
    if c not visited
        init h, ta
        WHILE ta = (I,j,k) ∈Triangles incident to vertex a
            If ( i=a & j=b & k≠c and k not visited ) h = k, break
            If ( i=a & k=b & j≠c and j not visited ) h = k, break
            If ( j=a & i=b & k≠c and k not visited ) h = k, break
            If ( j=a & k=b & i≠c and i not visited ) h = k, break
            If ( k=a & i=b & j≠c and j not visited ) h = k, break
            If ( k=a & b=b & i≠c and i not visited ) h = k, break
        If h not set
            d = 0
            WHILE d < dim
                dataOut [ c x dim + d ]=dataIn [ c x dim + d ]+ dataOut [ b x dim + d ]
                d = d + 1
        else
            d = 0
            WHILE d < dim
            dataOut [ c x dim + d ] =
                                dataIn [ c x dim + d ] + dataOut [ b x dim + d ]
                                – dataOut [ h x dim + d ] + dataOut [ a x dim + d ]
            d = d + 1
```

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```
            Mark c as visited
        g = 3, d = 0
        WHILE g < fanSize
            q = fan ( g )
            if q not visited
                WHILE d < dim
                    dataOut [ q x dim + d ] =
                                dataIn [ q x dim + d ] + dataOut [ c x dim + d ]
                                - dataOut [ b x dim + d ] + dataOut [ a x dim + d ]
                    d = d + 1
                b = c
                c = q
```

The following table contains the prediction types index used in the Inverse Prediction 1D FU:

Name of prediction mode	Value
No Prediction	**0**
Differential Prediction	**1**
XOR based prediction	**2**
Adaptive Differential Prediction	**3**
Circular Differential Prediction	**4**
Parallelogram Inverse Prediction	**5**

The detailed description of the inverse parallelogram prediction is described in Annex F.

ISO Standards using the FU	ISO/IEC 14496-16	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
dataIn_i	INT8, INT16, INT32, INT64	
difValue_i	INT8, INT16, INT32, INT64	
predMode_i	UINT_4	
fan_i	INT8, INT16, INT32, INT64	
dim_i	UINT8, UINT16, UINT32, UINT64	
n_i	INT8, INT16, INT32, INT64	
max_i	UINT8, UINT16, UINT32, UINT64	
Output		
Name	**Token**	
dataOut_o	INT8, INT16, INT32, INT64	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part16		

5.2.4 Algo_InversePredictionND

FU Name	Algo_InversePredictionND
Description	This FU allows five modes of inverse prediction. Not all the ports are used for each prediction mode. This FU can handle a number of dimD input tokens at a time.

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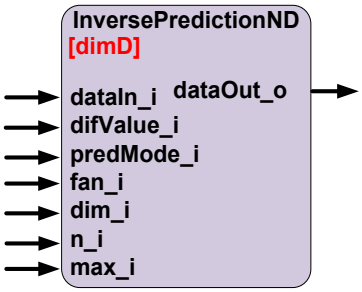
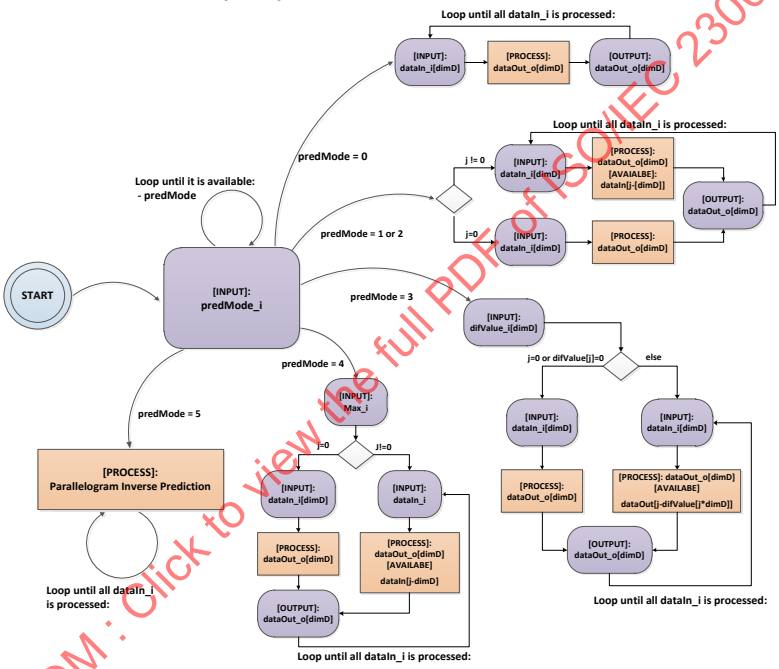


Port Name	Direction (I/O)	Token RANGE
dataIn_i	I	INT8, INT16, INT32, INT64
difValue_i	I	INT8, INT16, INT32, INT64
predMode_i	I	UINT_4
fan_i	I	INT8, INT16, INT32, INT64
dim_i	I	UINT8, UINT16, UINT32, UINT64
n_i	I	INT8, INT16, INT32, INT64
max_i	I	UINT8, UINT16, UINT32, UINT64
dataOut_o	O	INT8, INT16, INT32, INT64

Process Schematic (FSM):



Process Parallelogram Inverse Prediction Schematic (FSM):

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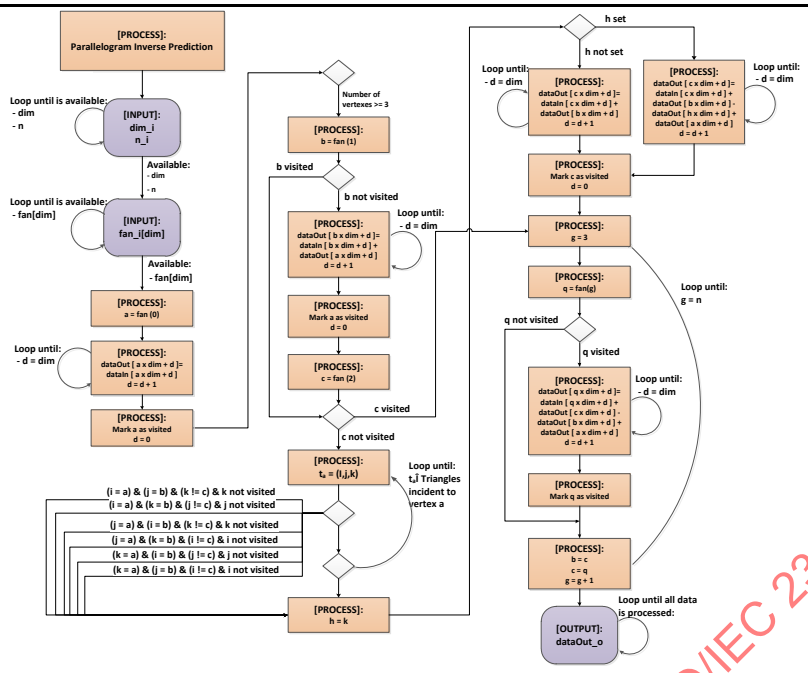

Inverse Prediction ND Process:
Switch(predMode)
{

Case 0: NP – No Prediction

$$dataOut[j] = dataIn[j], \qquad \forall j \in \{0\,..\,(N \times dimD) - 1\}$$

Case 1: Diff – Differential Prediction

$$dataOut[j] = \begin{cases} dataIn[j], \forall j \in 0 \\ dataIn[j] + dataOut[j - dimD], \forall\, j \in \{1\,..\,(N \times dimD) - 1\} \end{cases}$$

Case 2: XOR – based prediction

$$dataOut[j] = \begin{cases} dataIn[j], \forall j \in 0 \\ dataIn[j] \otimes dataOut[j - dimD], \forall\, j \in \{1\,..\,(N \times dimD) - 1\} \end{cases}$$

Case 3: Adaptive Prediction

$$dataOut[j] = \begin{cases} dataIn[j], if\ difValue[j] = 0\ or\ j = 0 \\ dataIn[j] + dataOut[j - difValue[j] \times dimD], otherwise \end{cases}$$

Case 4: Circular Differential Prediction

$$dataOut[j] = \begin{cases} dataIn[j], if\ difValue[j] = 0\ or\ j = 0 \\ dataIn[j] + dataOut[j - difValue[j] \times dimD], otherwise \end{cases}$$

$$d = \begin{cases} dataIn[j - dimD] + M_d - dataIn[j], if\ dataIn[j] > dataIn[j - dimD] \\ dataIn[j] + M_d - dataIn[j - dimD], otherwise \end{cases}$$

}

Case 5: Parallelogram Inverse Prediction

```
a = fan ( 0 )
if a not visited
    d = 0
    WHILE d < dim
        dataOut [ a x dim + d ] = dataIn [ a x dim + d ]
        d = d + 1
    Mark a as visited
If number of vertexes > 3
    b = fan ( 1 )
    if b not visited
        d = 0
        WHILE d < dim
```

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```
                dataOut [ b x dim + d ] = dataIn [ b x dim + d ] + dataOut  [ a x dim + d ]
                d = d + 1
            Mark b as visited
        c = fan ( 2 )
        if c not visited
            init h, ta
            WHILE ta = (I,j,k) ∈Triangles incident to vertex a
                If ( i=a & j=b & k≠c and k not visited ) h = k, break
                If ( i=a & k=b & j≠c and j not visited ) h = k, break
                If ( j=a & i=b & k≠c and k not visited ) h = k, break
                If ( j=a & k=b & i≠c and i not visited ) h = k, break
                If ( k=a & i=b & j≠c and j not visited ) h = k, break
                If ( k=a & b=b & i≠c and i not visited ) h = k, break
            If h not set
                d = 0
                WHILE d < dim
                    dataOut [ c x dim + d ]=dataIn [ c x dim + d ]+ dataOut [ b x dim + d ]
                    d = d + 1
            else
                d = 0
                WHILE d < dim
                dataOut [ c x dim + d ] =
                                dataIn [ c x dim + d ] + dataOut [ b x dim + d ]
                                – dataOut [ h x dim + d ] + dataOut [ a x dim + d ]
                d = d + 1
            Mark c as visited
        g = 3, d = 0
        WHILE g < fanSize
            q = fan ( g )
            if q not visited
                WHILE d < dim
                    dataOut [ q x dim + d ] =
                            dataIn [ q x dim + d ] + dataOut [ c x dim + d ]
                            - dataOut [ b x dim + d ] + dataOut [ a x dim + d ]
                    d = d + 1
                b = c
                c = q
```

The following table contains the prediction types index used in the Inverse Prediction ND FU:

Name of prediction mode	Value
No Prediction	**0**
Differential Prediction	**1**
XOR based prediction	**2**
Adaptive Differential Prediction	**3**
Circular Differential Prediction	**4**
Parallelogram Inverse Prediction	**5**

The detailed description of the inverse parallelogram prediction is described in Annex F.

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Input	
Name	**Token**
dataIn_i	INT8, INT16, INT32, INT64
difValue_i	INT8, INT16, INT32, INT64
predMode_i	UINT_4
fan_i	INT8, INT16, INT32, INT64
dim_i	UINT8, UINT16, UINT32, UINT64
n_i	INT8, INT16, INT32, INT64
max_i	UINT8, UINT16, UINT32, UINT64
Output	
Name	**Token**
dataOut_o	INT8, INT16, INT32, INT64

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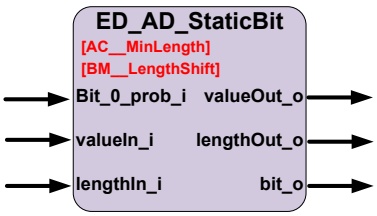
Parameter		
Name	**Description**	**Range**
dimD	Describes the number of tokens of type dataIn_i that are consumed at each firing. This parameter is set at the network configuration level.	Type: Integer Range: [1 .. 2^5]
Package		
package org.sc29.wg11.mpeg4.part16		

5.2.5 Algo_ED_AD_StaticBit

FU Name: Algo_ED_AD_StaticBit

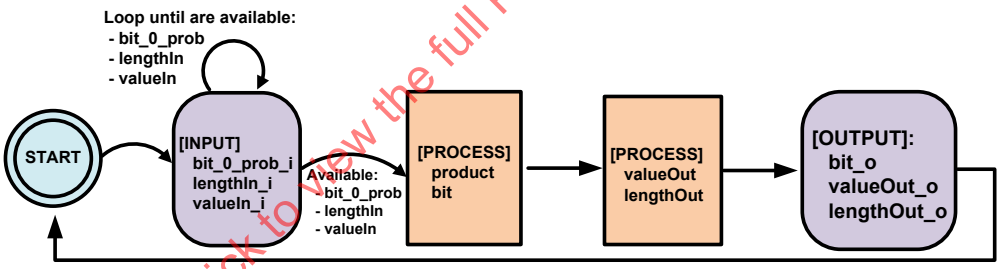
Description

This FU describes the arithmetic decoding process based on a static bit model.



Port Name	Direction (I/O)	Token RANGE
Bit_0_prob_i	I	UINT8, UINT16, UINT32, UINT64
valueIn_i	I	UINT8, UINT16, UINT32, UINT64
length_i	I	UINT8, UINT16, UINT32, UINT64
valueOut_o	O	UINT8, UINT16, UINT32, UINT64
lengthOut_o	O	UINT8, UINT16, UINT32, UINT64
bit_o	O	UINT8, UINT16, UINT32, UINT64

Process Schematic (FSM):



ED_AD_StaticBit Process:

```
START
INPUT:
    Bit_0_prob_i
    lengthIn_i
    valueIn_i
product = bit_0_prob * ( lengthIn >> BM_LengthShift )
bit = ( valueIn >= product )
if ( bit == 0 )
    valueOut = valueIn
    lengthOut = product
else
    valueOut = valueIn – product
    lengthOut = lengthIn – product
OUTPUT:
valueOut_o
lengthOut_o
GOTO START
```

ISO Standards using the FU: ISO/IEC 14496-16

Profiles@levels supported: All (Generic)

Input

Name	Token
Bit_0_prob_i	UINT8, UINT16, UINT32, UINT64
valueIn_i	UINT8, UINT16, UINT32, UINT64

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length_i	UINT8, UINT16, UINT32, UINT64	
Output		
Name	**Token**	
valueOut_o	UINT8, UINT16, UINT32, UINT64	
lengthOut_o	UINT8, UINT16, UINT32, UINT64	
bit_o	UINT8, UINT16, UINT32, UINT64	
Parameter		
Name	**Description**	**Range**
AC__MinLength	Describes the threshold for renormalization. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: [1 .. 2^{32}]
BM__LengthShift	Describes the length bits discarded before multiplication. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: [1 .. 2^{5}]
Package		
package org.sc29.wg11.mpeg4.part16		

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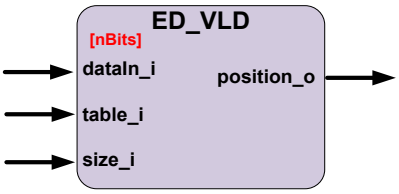
5.2.6 Algo_ED_VLD

FU Name: Algo_ED_VLD

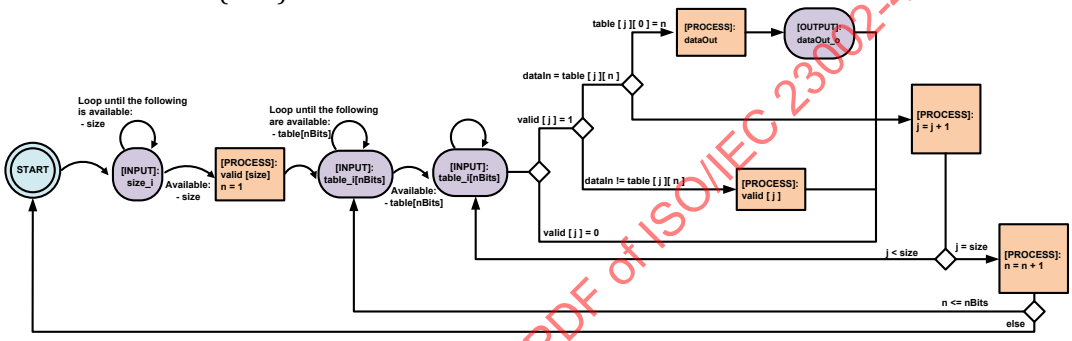
Description

This FU describes the Variable Length Decoding process.



Port Name	Direction (I/O)	Token RANGE
dataIn_i	I	UINT8, UINT16, UINT32, UINT64
table_i	I	UINT8, UINT16, UINT32, UINT64
size_i	I	UINT8, UINT16, UINT32, UINT64
position_o	O	UINT8, UINT16, UINT32, UINT64

Process Schematic (FSM):



ED_VLD Process:

```
START
SET valid[size] = 1
SET n = 1
DO
    DO
        If valid[j] = 1
            If dataIn=table[j][n]
                If table[j][0] = n
                    dataOut = j
            else
                valid[j] = 0
        j = j + 1
    WHILE j < size
    n = n + 1
WHILE n < nBits
GOTO START
```

The matrix tokens have to be send column based.

ISO Standards using the FU: ISO/IEC 14496-16

Profiles@levels supported: All (Generic)

Input

Name	Token
dataIn_i	UINT8, UINT16, UINT32, UINT64
table_i	UINT8, UINT16, UINT32, UINT64
size_i	UINT8, UINT16, UINT32, UINT64

Output

Name	Token
position_o	UINT8, UINT16, UINT32, UINT64

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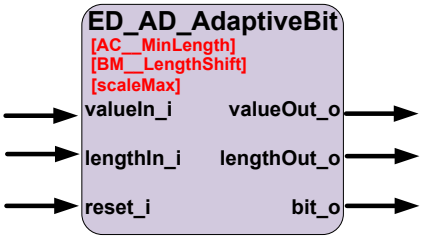
Parameter		
Name	**Description**	**Range**
nBits	Describes the length of the bits used for the search algorithm. This parameter is set at the network configuration level.	Type: Integer Range: [1 .. 2^5]
Package		
package org.sc29.wg11.mpeg4.part16		

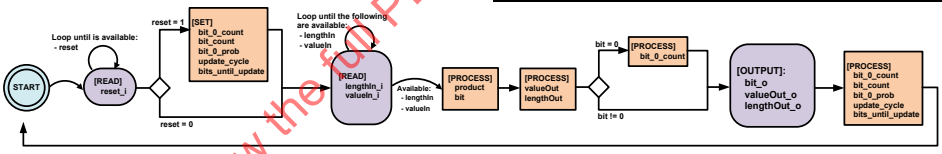
5.2.7 Alog_ED_AD_AdaptiveBit

FU Name	Algo_ED_AD_AdaptiveBit
Description	This FU describes the arithmetic decoding process based on a adaptive bit model as presented in [3,4].



Port Name	Direction (I/O)	Token RANGE
valueIn_i	I	UINT8, UINT16, UINT32, UINT64
length_i	I	UINT8, UINT16, UINT32, UINT64
reset_i	I	BOOLEAN
valueOut_o	O	UINT8, UINT16, UINT32, UINT64
lengthOut_o	O	UINT8, UINT16, UINT32, UINT64
bit_o	O	UINT8, UINT16, UINT32, UINT64

Process Schematic (FSM):



ED_AD_AdaptiveBit Process:

```
START
If reset = 1
        bit_0_count = 1;
        bit_count   = 2;
        bit_0_prob  = 1U << (BM__LengthShift - 1);
        update_cycle = bits_until_update = 4;

product = bit_0_prob * ( lengthIn >> BM_LengthShift )
bit = ( valueIn >= product )

if ( bit == 0 )
        valueOut = valueIn
        lengthOut = product
        ++bit_0_count
else
        valueOut = valueIn – product
        lengthOut = lengthIn – product

if (bit_count += update_cycle) > BM__MaxCount
        bit_count = (bit_count + 1) >> 1
        bit_0_count = (bit_0_count + 1) >> 1
        if bit_0_count = bit_count
                ++bit_count
scale = scaleMax / bit_count;
bit_0_prob = (bit_0_count * scale) >> (31 - BM__LengthShift);
update_cycle = (5 * update_cycle) >> 2;
if update_cycle > 64
        update_cycle = 64;
bits_until_update = update_cycle;
GOTO START
```

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ISO Standards using the FU	ISO/IEC 14496-16	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
valueIn_i	UINT8, UINT16, UINT32, UINT64	
length_i	UINT8, UINT16, UINT32, UINT64	
reset_i	BOOLEAN	
Output		
Name	**Token**	
valueOut_o	UINT8, UINT16, UINT32, UINT64	
lengthOut_o	UINT8, UINT16, UINT32, UINT64	
bit_o	UINT8, UINT16, UINT32, UINT64	
Parameter		
Name	**Description**	**Range**
AC_MinLength	Describes the threshold for renormalization. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: [1 .. 2^{32}]
BM_LengthShift	Describes the length bits discarded before multiplication. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: [1 .. 2^{5}]
scaleMax	Describes the max value to compute the scaled bit 0 probability. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: [1 .. 2^{32}]
Package		
package org.sc29.wg11.mpeg4.part16		

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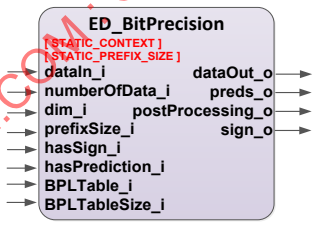
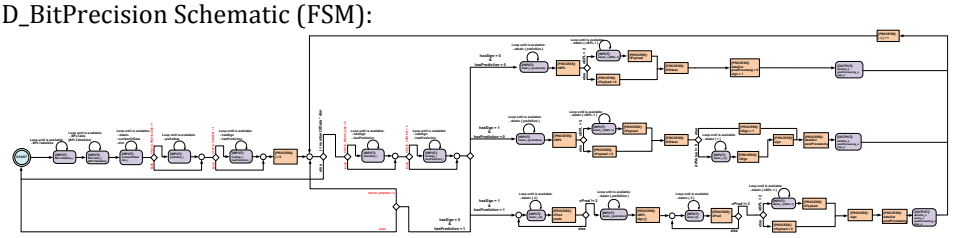
5.2.8 Algo_ED_BitPrecision

FU Name	Algo_ED_BitPrecision
Description	This FU describes the Entropy Decoding Bit Precision processes.



Port Name	Direction (I/O)	Token RANGE
dataIn_i	I	UINT_8
numerOfData_i	I	UINT8, UINT16, UINT32, UINT64
dim_i	I	UINT8, UINT16, UINT32, UINT64
prefixSize_i	I	UINT_8
hasSign_i	I	BOOLEAN
hasPrediction_i	I	BOOLEAN
BPLTable_i	I	UINT8, UINT16, UINT32, UINT64
BPLTableSize_i	I	UINT8, UINT16, UINT32, UINT64
dataOut_o	O	INT8, INT16, INT32, INT64
preds_o	O	INT8, INT16, INT32, INT64
postProcessing_o	O	BOOLEAN
sign_o	O	BOOLEAN

ED_BitPrecision Schematic (FSM):



ED_BitPrecision process:

START

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```
INPUT: BPLTableSize_i
INPUT: BPLTable_i [ BPLTableSize ]
INPUT: numberOfData_i
INPUT: dim_i
IF STATIC_CONTEXT = 1
    INPUT: hasSign_i
    INPUT: hasPrediction_i
IF STATIC_PREFIX_SIZE = 1
    INPUT: prefixSize_i
j = 0
PROCESS_CHUNK:
WHILE j < numberOfData * dim
    IF STATIC_PREFIX_SIZE = 0
        INPUT: prefixSize_i
    IF STATIC_CONTEXT = 0
        INPUT: hasSign_i
        INPUT: hasPrediction_i
    IF hasSign = 0 & hasPrediction = 0
        INPUT: dataIn { prefixSize }
        nBPL = dataIn
        IF nBPL > 2
            INPUT: dataIn { nBPL – 1 }
            nPayLoad = dataIn
        ELSE
            nPayLoad = 0
        difValue = BPLTable [ nBPL ] + nPayLoad
        dataOut = difValue
        postProcessing = 0
        sign = 0
        OUTPUT: dataOut
        OUTPUT: postProcessing_o
        OUTPUT: sign_o
            ELSE IF hasSign = 1 & hasPrediction = 0
                INPUT: dataIn { prefixSize }
                nBPL = dataIn
                if nBPL > 2
                    INPUT: dataIn { nBPL – 1 }
                    nPayLoad = dataIn
                ELSE
                    nPayLoad = 0
                difValue = BPLTable [ nBPL ] + nPayLoad
                IF difValue != 0
                    INPUT: dataIn { 1 }
                    nSign = dataIn
                ELSE
                    nSign = 1
                sign = nSign
                postProcessing = 1
                dataOut = difValue
                OUTPUT: dataOut
                OUTPUT: postProcessing_o
                OUTPUT: sign_o
            ELSE IF hasSign = 1 & hasPrediction = 1
                signDef[2] = { 1,-1 }
                predsOut [ j ] = 0
                DO
                    INPUT: dataIn { 2 }
                    nPred = dataIn
                    preds += nPred
                    WHILE nPred != 3
                INPUT: dataIn { prefixSize }
                nBPL = dataIn
                IF ( nBPL > 2 )
                    INPUT: dataIn { nBPL – 1 }
                    nPayLoad = dataIn
                ELSE
                    nPayLoad = 0
                difValue = BPLTable [ nBPL ] + nPayLoad
                dataOut = difValue
                IF preds != 0
                    postProcessing = 1
                ELSE
                    postProcessing = 0
```

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```
                    IF postProcessing != 0
                        sign = signDef [ difValue % 2 ]
                    ELSE
                        sign = 1
                    OUTPUT: dataOut_o
                    OUTPUT: preds_o
                    OUTPUT: postProcessing_o
                    OUTPUT: sign_o
                ELSE IF hasSign = 1 & hasPrediction = 0
                    IF STATIC_CONTEXT = 0
                        PROCESS_CHUNK
                    ELSE
                        GOTO START
    GOTO START
```

An input of size {N} has the meaning of a input of a N-size bit value.

NOTE The case when both hasSign=1 and hasPrediction=0 is not considered. The behaviour in this case is to return to the START stage (if the parameter STATIC_CONTEXT=1) or to process the next data (if the parameter STATIC_CONTEXT=0).

ISO Standards using the FU	ISO/IEC 14496-16	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
dataIn_i	UINT_8	
numerOfData_i	UINT8, UINT16, UINT32, UINT64	
dim_i	UINT8, UINT16, UINT32, UINT64	
prefixSize_i	UINT_8	
hasSign_i	BOOLEAN	
hasPrediction_i	BOOLEAN	
BPLTable_i	UINT8, UINT16, UINT32, UINT64	
BPLTableSize_i	UINT8, UINT16, UINT32, UINT64	
Output		
Name	**Token**	
dataOut_o	INT8, INT16, INT32, INT64	
preds_o	INT8, INT16, INT32, INT64	
postProcessing_o	BOOLEAN	
sign_o	BOOLEAN	
Parameter		
Name	**Description**	**Range**
STATIC_CONTEXT	Describes whether the context data (hasSign and hasPrediction) is read for every processing iteration. If set to 1, the context data is read only once and reused during the process, if set to 0, the context data is read for every processing interation. This parameter is set at the network configuration level.	Type:Boolean Range: {0,1}
STATIC_PREFIX_SIZE	Describes whether the prefix size value is read for every processing iteration. If set to 1, the prefix value is read only once and reused during the process, if set to 0, the prefix value is read for every processing interation. This parameter is set at the network configuration level.	Type:Boolean Range: {0,1}
Package		
package org.sc29.wg11.mpeg4.part16		

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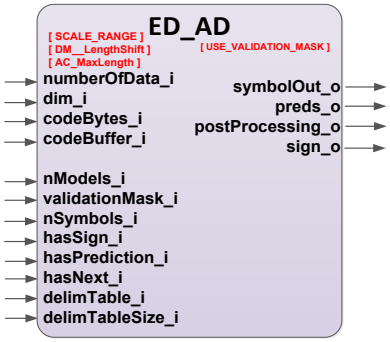
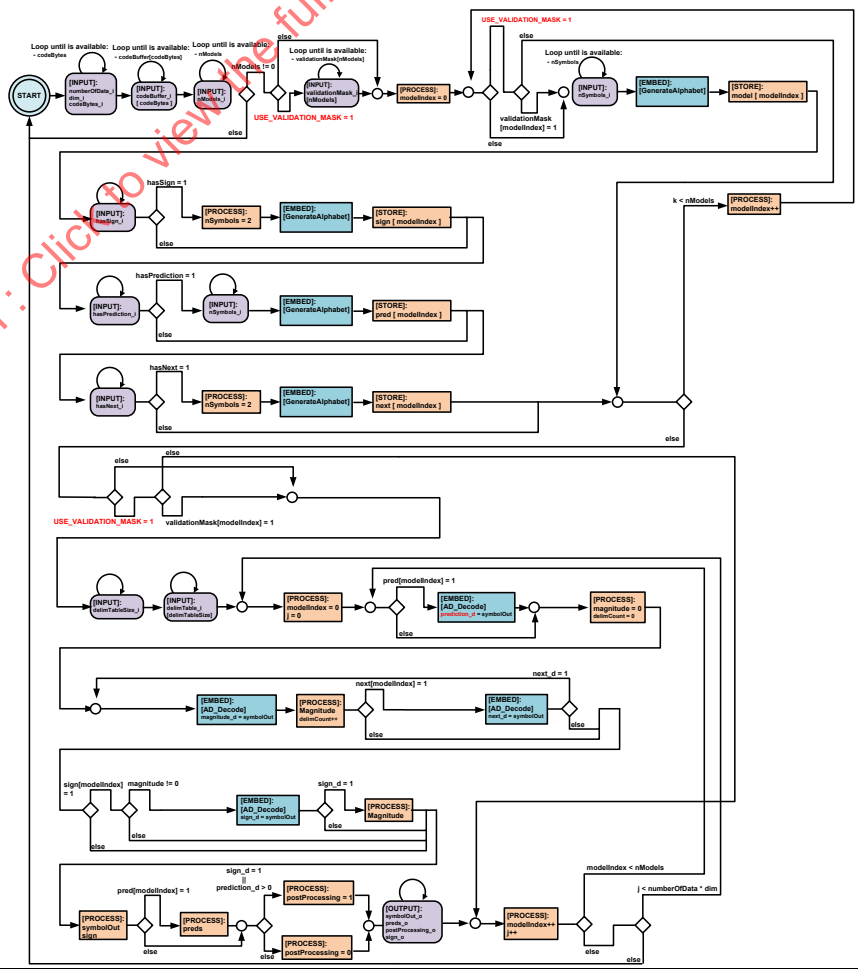
5.2.9 Algo_ED_AD

FU Name	Algo_ED_AD
Description	This FU describes the Entropy Decoding Arithmetic Decoding processes.



Port Name	Direction (I/O)	Token RANGE
numberOfData_i	I	UINT8, UINT16, UINT32, UINT64
dim_i	I	UINT8, UINT16, UINT32, UINT64
codeBytes_i	I	UINT8, UINT16, UINT32, UINT64
codeBuffer_i	I	UINT_8
nModels_i	I	UINT_8
validationMask_i	I	BOOLEAN
nSymbols_i	I	UINT8, UINT16, UINT32, UINT64
hasSign_i	I	BOOLEAN
hasPrediction_i	I	BOOLEAN
hasNext_i	I	BOOLEAN
delimTableSize_i	I	UINT_8
delimTable_i	I	UINT8, UINT16, UINT32, UINT64
symbolOut_o	O	INT8, INT16, INT32, INT64
preds_o	O	INT8, INT16, INT32, INT64
postProcessing_o	O	BOOLEAN
sign_o	O	BOOLEAN

ED_AD Schematic (FSM):



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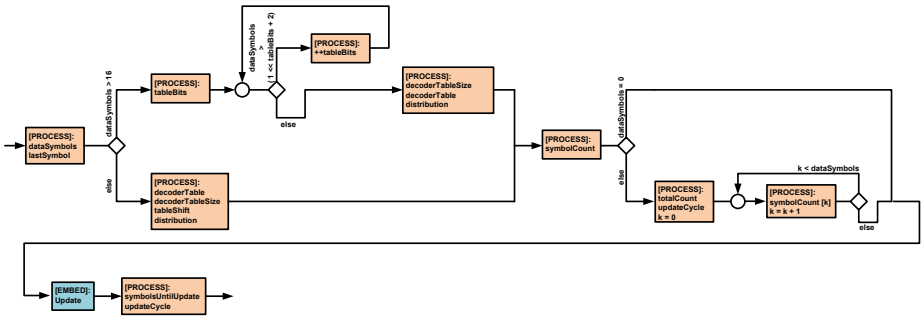
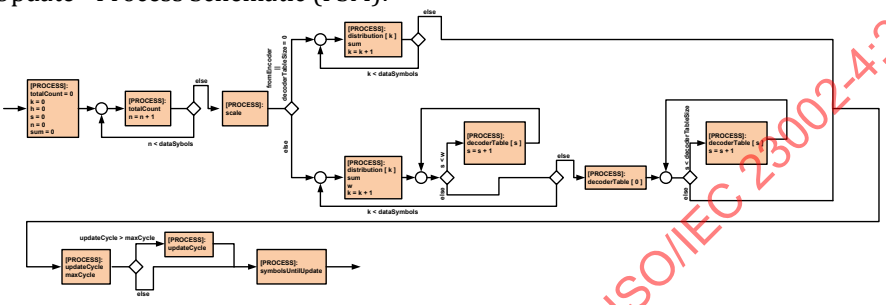
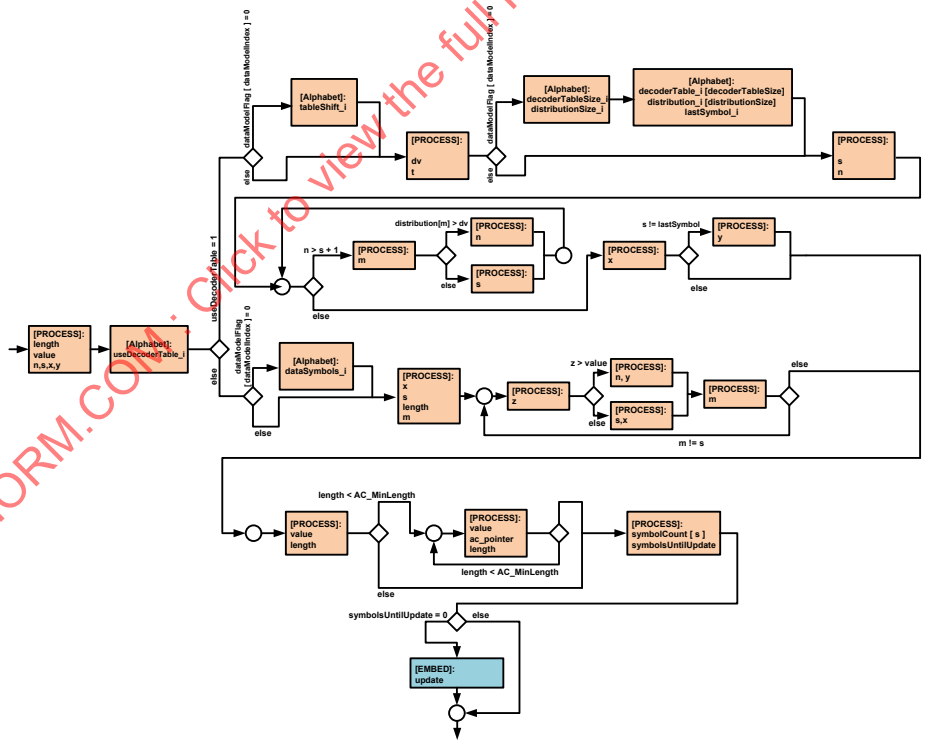
Generate Alphabet Process Schematic (FSM):



Update - Process Schematic (FSM):



Generate Alphabet Process:
Arithmetic Decode Adaptive Data - Process Schematic (FSM):



ED_AD process:

START
INPUT: numberOfData_i
INPUT: dim_i
INPUT: codeBytes_i
INPUT: codeBuffer_i[codeBytes]
INPUT: nModels_i
if nModels != 0

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```
 if USE_VALIDATION_MASK = 1
      INPUT: validationMask_i [ nModels ]
modelIndex = 0
k = 0
DO
   if USE_VALIDATION_MASK = 1
     if validationMask [ modelIndex ] = 1
          GOTO MODEL_CONFIG
     else
          GOTO NEXT_MODEL_CONFIG
   else
     GOTO MODEL_CONFIG

   MODEL_CONFIG:
      INPUT: nSymbols_i
      EMBED: Generate Alphabet
      STORE: model [ modelIndex ]
      INPUT: hasSign_i
      if hasSign = 1
             nSymbols = 2
             EMBED: Generate Alphabet
             STORE: sign [ modelIndex ]
      INPUT: hasPrediction_i
      if hasPrediction = 1
             INPUT: nSymbols_i
             EMBED: Generate Alphabet
             STORE: pred [ modelIndex ]
      INPUT: hasNext_i
             nSymbols = 2
             EMBED: Generate Alphabet
             STORE: next [ modelIndex ]
      k = k + 1
      WHILE k < nModels
INPUT: delimTableSize_i
INPUT: delimTable_i [ delimTableSize ]

INIT:
modelIndex = 0
j = 0
DECODE:
      if USE_VALIDATION_MASK = 1
          if validationMask [ modelIndex ] = 1
               GOTO MODEL_PROCESS
          else
               GOTO NEXT_MODEL
      else
          GOTO MODEL_PROCESS

 MODEL_PROCESS:
      if pred[modelIndex] = 1
             EMBED: AD_Decode (prediction_d = symbolOut)
      magnitude = 0
      delimCount = 0
      HAS_NEXT:
             EMBED: AD_DECODE (magnitude_d = symbolOut)
             Magnitude
             delimCount++
             if next [ modelIndex ] = 1
                  EMBED: AD_DECODE (next_d = symbolOut)
             if next_d = 1
                  GOTO HAS_NEXT
             if sign[modelIndex] = 1
                  if magnitude != 0
                       EMBED: AD_DECODE (sign_d = symbolCount)
             symbolOut = magnitude
             sign = sign_d
             if pred[modelIndex] = 1
                  preds = prediction_d
             if sign_d = 1 || prediction_d > 0
                  postProcessing = 1
             else
                  postProcessing = 0
             OUTPUT: symbolOut_o
```

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```
                    OUTPUT: preds_o
                    OUTPUT: postProcessing_o
                    OUTPUT: sign_o

                    NEXT_MODEL:
                        modelIndex++
                        j++

                    if modelIndex < nModels
                        GOTO DECODE
                    if j < numberOfData * dim
                        GOTO INIT
GOTO START
```

Generate Alphabet Process:

```
dataSymbols = nSymbols
lastSymbol = nSymbols – 1
if dataSymbols > 16
    tableBits = 3
    WHILE dataSymbols > ( 1 << (tableBits + 2) )
        ++tableBits
    tableSize = 1 << tableBits
    tableShift = DM__LengthShift – tableBits
    distribution [ 2 * dataSymbols + tableSize + 2]
    decoderTable = distribution + 2 * dataSymbols
else
    decoderTable = 0
    tableSize = 0
    tableShift = 0
    distribution [ 2 * dataSymbols ]
symbolCount = distribution + dataSymbols
if dataSymbols != 0
totalCount = 0
updateCycle = dataSymbols
k = 0
WHILE k < dataSymbols
    symbolCount [ k ] = 1
    k = k + 1
EMBED: Update
symbolsUntilUpdate = ( dataSymbols + 6 ) >> 1
updateCycle = ( dataSymbols + 6 ) >> 1
```

Update – Process:

```
totalCount = 0
k = 0
h = 0
s = 0
n = 0
sum = 0
WHILE n < dataSymbols
    totalCount += ( symbolCount [ n ] = (symbolCount [ n ] + 1 ) >> 1 )
scale = SCALE_RANGE / totalCount
if fromEncofer = true | tableSize = 0
    WHILE k < dataSymbols
        distribution [ k ] = ( scale * sum ) >> ( 31 – DM_LengthShift )
        sum += symbolCount [ k ]
        k = k + 1
else
    WHILE k < dataSymbols
        distribution [ k ] = ( scale * sum ) >> ( 31 – DM_LengthShift )
        sum += symbolCount [ k ]
        w = distribution [ k ] >> tableShift
        WHILE  s < w
            decoderTable [++s] = k – 1
    decoderTable [ 0 ] = 0
    WHILE s <= tableSize
        decoderTable [++s] = dataSymbols – 1
updateCycle = ( 5 * updateCycle ) >> 2
maxCycle = ( dataSymbols + 6 ) << 3
if ( updateCycle > maxCycle )
    updateCycle = maxCycle
symbolsUntilUpdate = updateCycle
```

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Arithmetic Decode Adaptive Data Process:

```
codeBytes = 0
WHILE codeBytes <= 0
        INPUT: codeBytes
length = 0
value = 0
n = 0
s = 0
x = 0
y = 0
if useDecoderTable = 1
        if dataModelFlag [ dataModelIndex ] = 0
                INPUT: tableShift
        dv  = value / ( length >>= DM__LengthShift )
        t = dv >> tableShift
        s = decoderTable [ t ]
        n = decoderTable [ t+1 ] + 1
        WHILE n > s + 1
                m = ( s + n ) >> 1
                if distribution [ m ] > dv
                        n = m
                else
                        s = m
        x = distribution [ s ] * length
        if s != lastSymbol
                y = distribution [ s + 1] * length
else
        x = 0
        s = 0
        length >>= DM_LengthShift
        m = ( n = dataSymbols ) >> 1
        DO
                z = length * distribution [ m ]
                if z > value
                        n = m
                        y = z
                else
                        s = m
                        x = z
                WHILE m = ((s+n) >> 1 ) != s
value -= x
length = y – x
if length < AC__MinLength
DO
        value = (value << 8) | ++ac_pointer
        WHILE (length <<= 8) < AC__MinLength
++symbolCount [ s ]
if -- symbolsUntilUpdate = 0
        EMBED: Update
```

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Input	
Name	**Token**
numberOfData_i	UINT8, UINT16, UINT32, UINT64
dim_i	UINT8, UINT16, UINT32, UINT64
codeBytes_i	UINT8, UINT16, UINT32, UINT64
codeBuffer_i	UINT_8
nModels_i	UINT_8
validationMask_i	BOOLEAN
nSymbols_i	UINT8, UINT16, UINT32, UINT64
hasSign_i	BOOLEAN
hasPrediction_i	BOOLEAN
hasNext_i	BOOLEAN
delimTableSize_i	UINT_8

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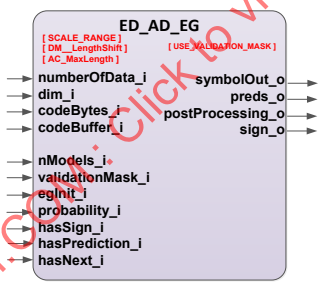
delimTable_i	UINT8, UINT16, UINT32, UINT64	
Output		
Name	**Token**	
symbolOut_o	INT8, INT16, INT32, INT64	
preds_o	INT8, INT16, INT32, INT64	
postProcessing_o	BOOLEAN	
sign_o	BOOLEAN	
Parameter		
Name	**Description**	**Type / Range**
AC__MaxLength	Describes the maximum AC interval. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: [1 .. 2^{32}]
DM__LengthShift	Describes the number of bits discarded before multiplication. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: [1 .. 2^{32}]
SCALE_RANGE	Describes the range for the scale value. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: [1 .. 2^{32}]
USE_VALIDATION_MASK	Indicates whether to use the validation mask input port or not.(0 – NO, 1 – YES)	Type:Unsigned Integer Range: {0,1}
Package		
package org.sc29.wg11.mpeg4.part16		

5.2.10 Algo_ED_AD_EG

FU Name	Algo_ED_AD_EG
Description	This FU describes the Entropy Decoding Arithmetic Decoding Exponential Golomb processes.



Port Name	Direction (I/O)	Token RANGE
numberOfData_i	I	UINT8, UINT16, UINT32, UINT64
dim_i	I	UINT8, UINT16, UINT32, UINT64
codeBytes_i	I	UINT8, UINT16, UINT32, UINT64
codeBuffer_i	I	UINT_8
nModels_i	I	UINT_8
validationMask_i	I	BOOLEAN
egInit_i	I	UINT8, UINT16, UINT32, UINT64
probability_i	I	UINT8, UINT16, UINT32, UINT64
hasSign_i	I	BOOLEAN
hasPrediction_i	I	BOOLEAN
hasNext_i	I	BOOLEAN
symbolOut_o	O	INT8, INT16, INT32, INT64
preds_o	O	INT8, INT16, INT32, INT64
postProcessing_o	O	BOOLEAN
sign_o	O	BOOLEAN

ED_AD_EG Schematic (FSM):

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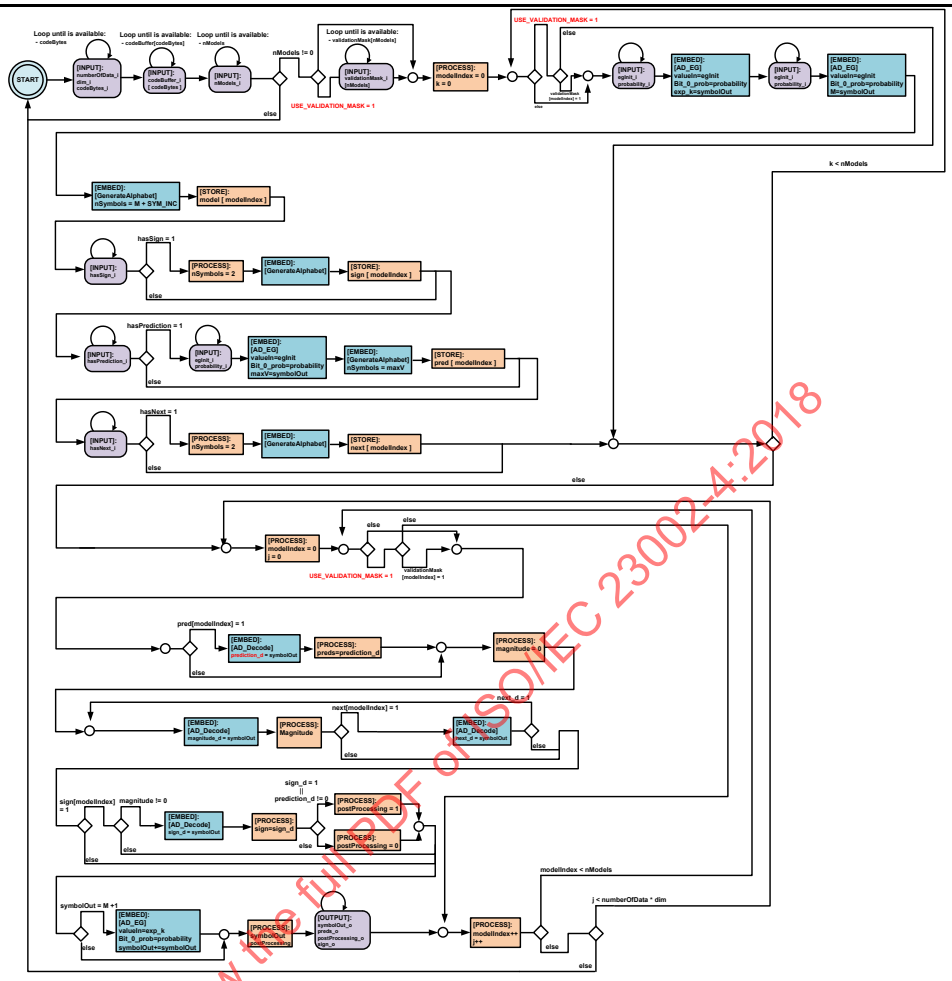
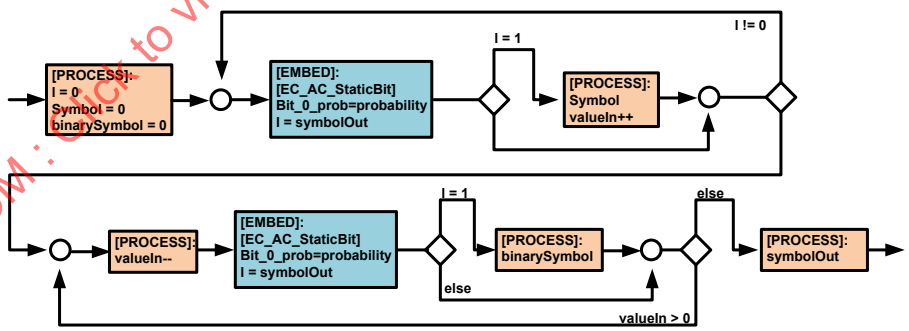
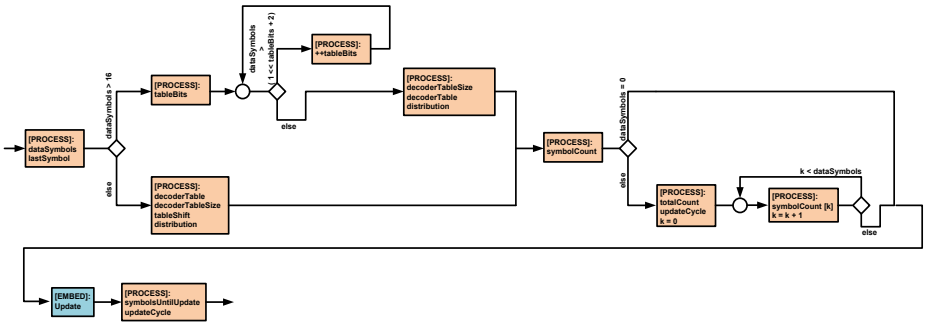


ED_AD_EG Process Schematic (FSM):



Generate Alphabet Process Schematic (FSM):



Update - Process Schematic (FSM):

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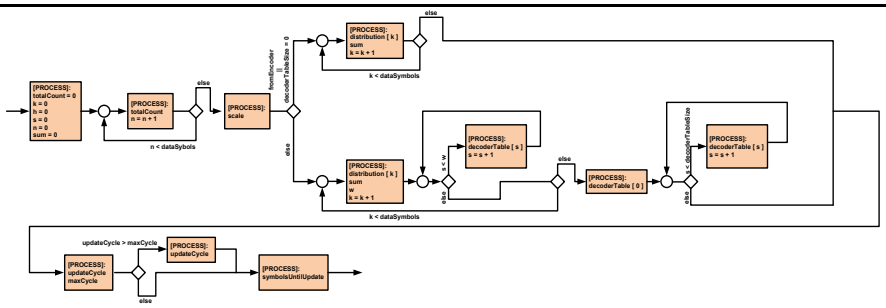
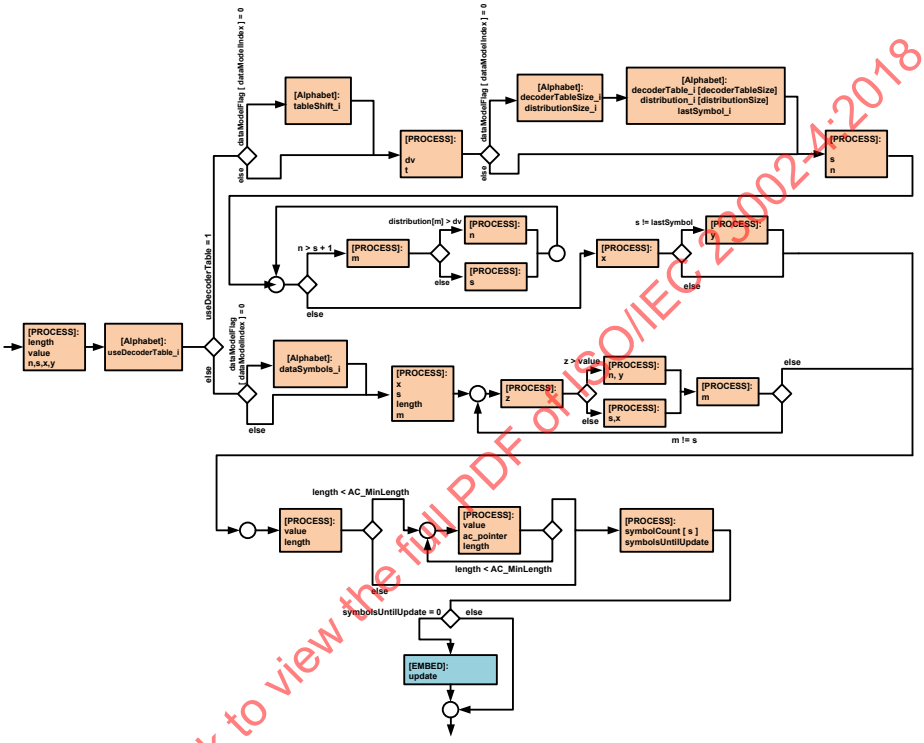


Arithmetic Decode Adaptive Data - Process Schematic (FSM):



ED_AD_EG process:

```
START
INPUT: numberOfData_i
INPUT: dim_i
INPUT: codeBytes_i
INPUT: delimTableSize_i
INPUT: codeBuffer_i[codeBytes]
INPUT: delimTable_i[delimTableSize]
INPUT: nModels_i
if USE_VALIDATION_MASK = 1
    INPUT: validationMask[nModels]
if nModels != 0
    modelIndex = 0
    k = 0
     INPUT: egInit_i
     INPUT: probability_i
     EMBED: AD_EG (valueIn=egInit, Bit_0_prob=probability,exp_k=symbolOut)
     INPUT: egInit_i
     INPUT: probability_i
     EMBED: AD_EG (valueIn=egInit, Bit_0_prob=probability,exp_k=symbolOut)
    DO
        if USE_VALIDATION_MASK = 1
            if validationMask [nModels] = 1
                EMBED: Generate Alphabet (nSymbols=M+SYM_INC)
                STORE: model [ modelIndex ]
                INPUT: hasSign_i
                if hasSign = 1
                    nSymbols = 2
                    EMBED: Generate Alphabet
                    STORE: sign [ modelIndex ]
```

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```
                    INPUT: hasPrediction_i
                    if hasPrediction = 1
                        INPUT: egInit_i
                        INPUT: probability_i
                        EMBED: AD_EG (valueIn=egInit, Bit_0_prob=probability,maxV=symbolOut)
                        EMBED: Generate Alphabet (nSymbols=maxV)
                        STORE: pred [ modelIndex ]
                    INPUT: hasNext_i
                        nSymbols = 2
                        EMBED: Generate Alphabet
                        STORE: next [ modelIndex ]
                    k = k + 1
                    WHILE k < nModels
        j = 0
        DECODE:
        modelIndex = 0
        NEXT_MODEL:
            if USE_VALIDATION_MASK = 1
                if validationMask [nModel] = 1
                    if pred[modelIndex] = 1
                        EMBED: AD_Decode (prediction_d = symbolOut)
                    magnitude = 0
                    HAS_NEXT:
                        EMBED: AD_DECODE (magnitude_d = symbolOut)
                        Magnitude
                        if next [ modelIndex ] = 1
                            EMBED: AD_DECODE (next_d = symbolOut)
                        if next_d = 1
                            GOTO HAS_NEXT
                        if sign[modelIndex] = 1
                            if magnitude != 0
                                EMBED: AD_DECODE (sign_d = symbolCount)
                        EMBED: AD_EG (valueIn=exp_k, bit_0_prob=probability,  symbolOut+=symbolOut)
                        symbolOut = magnitude
                        sign = sign_d
                         if pred[modelIndex] = 1
                            preds = prediction_d
                        if sign_d = 1 || prediction_d != 0
                            postProcessing = 1
                        else
                            postProcessing = 0
                        OUTPUT: symbolOut_o
                        OUTPUT: predst_o
                        OUTPUT: postProcessing_o
                        OUTPUT: sign_o
                        modelIndex++
                        if modelIndex < nModels
                            GOTO NEXT_MODEL
                        j++
                        if j < numberOfData * dim
                            GOTO DECODE
        GOTO START
```

AD_EG Process:

```
    START
    l = 0
    symbol = 0
    binarySymbol = 0
    DO
        EMBED: EC_AC_StaticBit (bit_0_prob=probability,l = symbolOut)
        if l = 1
            symbol += (1<<valueIn)
            valueIn++
        WHILE l != 0
    WHILE valueIn—
        EMBED: EC_AC_StaticBit (bit_0_prob=probability,l = symbolOut)
        if l = 1
        binarySymbol |= (1<<valueIn)
    symbolOut = symbol + binarySymbol
```

Generate Alphabet Process:

```
    dataSymbols = nSymbols
```

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```
lastSymbol = nSymbols – 1
if dataSymbols > 16
        tableBits = 3
        WHILE dataSymbols > ( 1 << (tableBits + 2) )
                ++tableBits
        tableSize = 1 << tableBits
        tableShift = DM_LengthShift – tableBits
        distribution [ 2 * dataSymbols + tableSize + 2]
        decoderTable = distribution + 2 * dataSymbols
else
        decoderTable = 0
        tableSize = 0
        tableShift = 0
        distribution [ 2 * dataSymbols ]
symbolCount = distribution + dataSymbols
if dataSymbols != 0
totalCount = 0
updateCycle = dataSymbols
k = 0
WHILE k < dataSymbols
        symbolCount [ k ] = 1
        k = k + 1
EMBED: Update
symbolsUntilUpdate = ( dataSymbols + 6 ) >> 1
updateCycle = ( dataSymbols + 6 ) >> 1
```

Update – Process:

```
totalCount = 0
k = 0
h = 0
s = 0
n = 0
sum = 0
WHILE n < dataSymbols
        totalCount += ( symbolCount [ n ] = (symbolCount [ n ] + 1 ) >> 1 )
scale = SCALE_RANGE / totalCount
if fromEncofer = true | tableSize = 0
        WHILE k < dataSymbols
                distribution [ k ] = ( scale * sum ) >> ( 31 – DM_LengthShift )
                sum += symbolCount [ k ]
                k = k + 1
else
        WHILE k < dataSymbols
                distribution [ k ] = ( scale * sum ) >> ( 31 – DM_LengthShift )
                sum += symbolCount [ k ]
                w = distribution [ k ] >> tableShift
                WHILE  s < w
                        decoderTable [++s] = k – 1
        decoderTable [ 0 ] = 0
        WHILE s <= tableSize
                decoderTable [++s] = dataSymbols – 1
updateCycle = ( 5 * updateCycle ) >> 2
maxCycle = ( dataSymbols + 6 ) << 3
if ( updateCycle > maxCycle )
        updateCycle = maxCycle
symbolsUntilUpdate = updateCycle
```

Arithmetic Decode Adaptive Data Process:

```
codeBytes = 0
WHILE codeBytes <= 0
        INPUT: codeBytes
length = 0
value = 0
n = 0
s = 0
x = 0
y = 0
if useDecoderTable = 1
        if dataModelFlag [ dataModelIndex ] = 0
                INPUT: tableShift
        dv  = value / ( length >>= DM_LengthShift )
        t = dv >> tableShift
```

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```
        s = decoderTable [ t ]
        n = decoderTable [ t+1 ] + 1
        WHILE n > s + 1
            m = ( s + n ) >> 1
            if distribution [ m ] > dv
                n = m
            else
                s = m
        x = distribution [ s ] * length
        if s != lastSymbol
            y = distribution [ s + 1] * length
else
        x = 0
        s = 0
        length >>= DM_LengthShift
        m = ( n = dataSymbols ) >> 1
        DO
            z = length * distribution [ m ]
            if z > value
                n = m
                y = z
            else
                s = m
                x = z
            WHILE m = ((s+n) >> 1 ) != s
value -= x
length = y – x
if length < AC__MinLength
DO
        value = (value << 8) | ++ac_pointer
        WHILE (length <<= 8) < AC__MinLength
++symbolCount [ s ]
if  -- symbolsUntilUpdate = 0
        EMBED: Update
```

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Input	
Name	**Token**
numberOfData_i	UINT8, UINT16, UINT32, UINT64
dim_i	UINT8, UINT16, UINT32, UINT64
codeBytes_i	UINT8, UINT16, UINT32, UINT64
codeBuffer_i	UINT_8
nModels_i	UINT_8
validationMask_i	BOOLEAN
egInit_i	UINT8, UINT16, UINT32, UINT64
probability_i	UINT8, UINT16, UINT32, UINT64
hasSign_i	BOOLEAN
hasPrediction_i	BOOLEAN
hasNext_i	BOOLEAN
Output	
Name	**Token**
symbolOut_o	INT8, INT16, INT32, INT64
preds_o	INT8, INT16, INT32, INT64
postProcessing_o	BOOLEAN
sign_o	BOOLEAN
Parameter	

Name	**Description**	**Type / Range**
AC__MaxLength	Describes the maximum AC interval. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: [1 .. 2^{32}]

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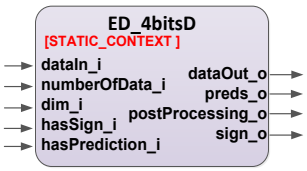
DM__LengthShift	Describes the number of bits discarded before multiplication. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: [1 .. 2^{32}]
SCALE_RANGE	Describes the range for the scale value. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: [1 .. 2^{32}]
USE_VALIDATION_MASK	Indicates whether to use the validation mask input port or not.(0 – NO, 1 – YES)	Type:Unsigned Integer Range: {0,1}
Package		
package org.sc29.wg11.mpeg4.part16		

5.2.11 Algo_ED_4bitsD

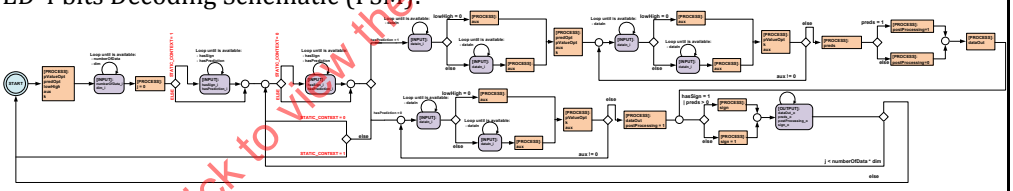
FU Name: Algo_ED_4bitsD

This FU describes the Entropy Decoding - 4 bits Decoding processes.



Port Name	Direction (I/O)	Token RANGE
dataIn_i	I	UINT_8
numerOfData_i	I	UINT8, UINT16, UINT32, UINT64
dim_i	I	UINT8, UINT16, UINT32, UINT64
hasSign_i	I	BOOLEAN
hasPrediction_i	I	BOOLEAN
dataOut_o	O	INT8, INT16, INT32, INT64
preds_o	O	INT8, INT16, INT32, INT64
postProcessing_o	O	BOOLEAN
sign_o	O	BOOLEAN

ED 4 bits Decoding Schematic (FSM):



Description

ED 4 bits Decoding process:

```
START
signDef = { -1, 1 }
pValueOpt = 0
predOpt = 0
lowHigh = 0
aux = 0
k = 0
INPUT:
        numberOfData_i
        dim_i
  IF STATIC_CONTEXT = 1
        INPUT:
                hasSign_i
                hasPrediction_i
j = 0
DO
        IF STATIC_CONTEXT = 1
                INPUT:
                        hasSign_i
                        hasPrediction_i
        IF hasPrediction = 1
                INPUT:
                        dataIn_i
                IF lowHigh = 0
                        aux = dataIn & 15
                ELSE
                        INPUT:
```

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```
                        dataIn_i
                    aux = dataIn & 240
                lowHigh = (lowHigh+1)%2
                predOpt = aux & 7
                pValueOpt = 0
                aux >>= 3
                pValueOpt += aux
                WHILE aux
                    INPUT:
                        dataIn_i
                    IF lowHigh = 0
                        aux = dataIn & 15
                    ELSE
                        INPUT:
                            dataIn_i
                        aux = dataIn & 240
                    lowHigh = (lowHigh+1)%2
                    pValueOpt += (aux&7) << k
                    k += 3
                    aux >>= 3
                    pValueOpt += aux << k
                IF preds > 0
                    postProcessing = 1
                 ELSE
                    postProcessing = 0
                preds = predOpt
                IF hasSign = 1 | preds > 0
                    sign = signDef [ pValueOpt % 2 ]
                ELSE
                    sign = 1
                dataOut = pValueOpt
                OUTPUT: dataOut_o
                OUTPUT: preds_o
                OUTPUT: postProcessing_o
                OUTPUT: sign_o

            ELSE IF hasPrediction = 0
                k = 0
                pValueOpt = 0
                DO
                    INPUT:
                        dataIn_i
                    if lowHigh = 0
                        aux = dataIn & 15
                    else
                        INPUT:
                            dataIn_i
                        aux = dataIn & 240
                    lowHigh = (lowHigh+1)%2
                    pValueOpt += (aux&7) << k
                    k += 3
                    aux >>= 3
                    pValueOpt += aux << k
                    WHILE aux
                 dataOut = pValueOpt
                 IF hasSign = 1
                    sign = signDef [ pValueOpt % 2 ]
                 ELSE
                    sign = 1
                postProcessing = 1
                OUTPUT: dataOut_o
                OUTPUT: postProcessing_o
                OUTPUT: sign_o
            j++
            ELSE
                IF STATIC_CONTEXT = 1
                    GOTO START
            WHILE j < numberOfData * dim
        GOTO START
```

NOTE
The following cases are not considered:
— hasSign=0, hasPrediction=0;

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	— hasSign=0, hasPrediction=1. The behaviour in this case is to return to the START stage (if the parameter STATIC_CONTEXT=1) or to process the next data (if the parameter STATIC_CONTEXT=0).
ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Input	
Name	**Token**
dataIn_i	UINT_8
numerOfData_i	UINT8, UINT16, UINT32, UINT64
dim_i	UINT8, UINT16, UINT32, UINT64
hasSign_i	BOOLEAN
hasPrediction_i	BOOLEAN
Output	
Name	**Token**
dataOut_o	INT8, INT16, INT32, INT64
preds_o	INT8, INT16, INT32, INT64
postProcessing_o	BOOLEAN
sign_o	BOOLEAN

Parameter		
Name	**Description**	**Type / Range**
STATIC_CONTEXT	Describes whether the context data (hasSign and hasPrediction) is read for every processing iteration. If set to 1, the context data is read only once and reused during the process; if set to 0, the context data is read for every processing interation. This parameter is set at the network configuration level.	Type:Boolean Range: {0,1}
Package		
package org.sc29.wg11.mpeg4.part16		

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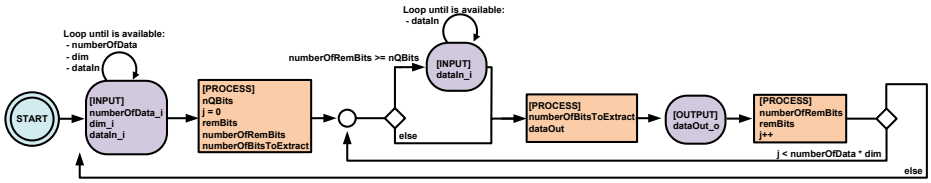
5.2.12 Algo_ED_FixedLength

FU Name	Algo_ED_FixedLength
Description	This FU describes the Entropy Decoding Fixed Length processes.

Port Name	Direction (I/O)	Token RANGE
dataIn_i	I	UINT_8
numerOfData_i	I	UINT8, UINT16, UINT32, UINT64
dim_i	I	UINT8, UINT16, UINT32, UINT64
dataOut_o	O	INT8, INT16, INT32, INT64

ED Fixed Length Decoding Schematic (FSM):



ED Fixedlength Decoding process:

START
INPUT:
numberOfData_i
dim_i

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```
        predMode_i
        dataIn_i
    nQBits = dataIn
    j = 0
    remBits = 0
    numberOfRemBits = 0
    numberOfBitsToExtract = 0
    DO
        If numberOfRemBits >= nQBits
            INPUT:
                dataIn_i
        numberOfBitsToExtract = nQBits - numberOfRemBits
        dataOut = remBits | ( dataIn[numberOfBitsToExtract] )
        numberOfRemBits = nQBits – numberOfBitsToExtract
        remBits = numberOfRemBits from dataIn
        j++
        WHILE j < numberOfData * dim
    GOTO START
```

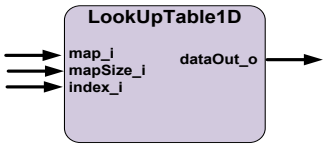
NOTE
remBits are the remaining bits from the last iterative operation.
numberOfRemBits is the number of remaining bits from the last iterative operation.
numberOfBitsToExtract is the number of necessary bits to complete a number of nQBits.

ISO Standards using the FU	ISO/IEC 14496-16	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
dataIn_i	UINT_8	
numerOfData_i	UINT8, UINT16, UINT32, UINT64	
dim_i	UINT8, UINT16, UINT32, UINT64	
Output		
Name	**Token**	
dataOut_o	INT8, INT16, INT32, INT64	
Parameter		
Name	**Description**	**Range**

5.2.13 Algo_LookUpTable1D

FU Name: Algo_LookUpTable1D

Description: The FU implements the Look-Up-Table concept by using an 1-dimensional array as a table.



Port Name	Direction (I/O)	Token RANGE
map_i	I	INT8, INT16, INT32, INT64
mapSize_i	I	UINT8, UINT16, UINT32, UINT64
index_i	I	UINT8, UINT16, UINT32, UINT64
dataOut_o	O	INT8, INT16, INT32, INT64

LookUpTable1D Process Schematic (FSM):

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	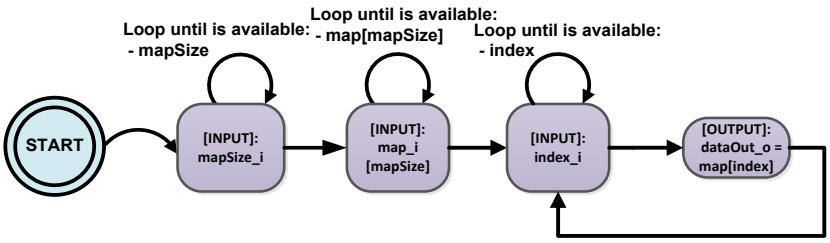 LookUpTable1D Process: START: INPUT: mapSize_i INPUT: map[mapSize] WHILE (true) INPUT: index_i dataOut=map[index_i] OUTPUT: dataOut_o
ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Input	
Name	**Token**
map_i	INT8, INT16, INT32, INT64
mapSize_i	UINT8, UINT16, UINT32, UINT64
index_i	UINT8, UINT16, UINT32, UINT64
Output	
Name	**Token**
dataOut_o	INT8, INT16, INT32, INT64
Parameter	

Name	**Description**	**Range**

Package
package org.sc29.wg11.mpeg4.part16

5.2.14 Algo_ContextModeling

FU Name	Algo_ContextModeling
Description	This FU describes context generation to be used in the entropy decoding units. It generates codec specific data sets based on the input values.

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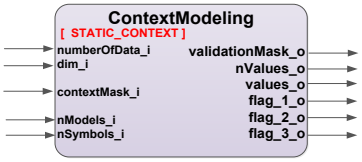
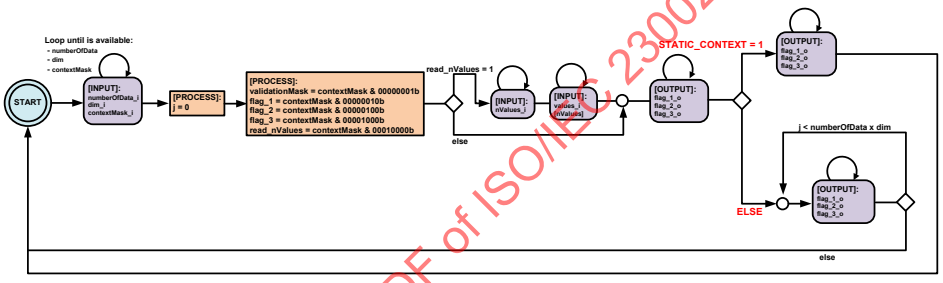


Port Name	Direction (I/O)	Token RANGE
numberOfData_i	I	UINT8, UINT16, UINT32, UINT64
dim_i	I	UINT8, UINT16, UINT32, UINT64
contextMask_i	I	UINT_8
nValues_i	I	UINT8, UINT16, UINT32, UINT64
values_i	I	INT8, INT16, INT32, INT64
validationMask_o	O	BOOLEAN
nValues_o	O	UINT8, UINT16, UINT32, UINT64
values_o	O	INT8, INT16, INT32, INT64
flag_1_o	O	BOOLEAN
flag_2_o	O	BOOLEAN
flag_3_o	O	BOOLEAN

ContextModeling Schematic (FSM):



ContextModeling process:

```
START
INPUT: numberOfData_i
INPUT: dim_i
INPUT: ccontextMask_i
j = 0
validationMask = contextMask & 00000001b
flag_1 = contextMask & 00000010b
flag_2 = contextMask & 00000100b
flag_3 = contextMask & 00001000b
read_nValues = contextMask & 00010000b
if read_nValues = 1
    INPUT: nValues_i
    INPUT: values_i [nValues]
OUTPUT: validationMask_o
OUTPUT: nValues_o
OUTPUT: values_o [nValues]
outputCounter  = 0
IF STATIC_CONTEXT = 1
    DO
        OUTPUT: flag_1_o
        OUTPUT: flag_2_o
        OUTPUT: flag_3_o
        outputCounter ++
        WHILE outputCounter <= nValues
ELSE
    DO
        outputCounter  = 0
        DO
            OUTPUT: flag_1_o
            OUTPUT: flag_2_o
            OUTPUT: flag_3_o
            WHILE outputCounter <= nValues
        j = j + 1
        WHILE j < numberOfData * dim
GOTO START
```

Bit position	7	6	5	4	3	2	1	0
	X	X	X	bit	bit	bit	bit	bit
Flag	X	X	X	Read N Values	flag_3	flag_3	flag_1	Validation Mask

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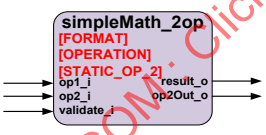
ISO Standards using the FU	ISO/IEC 14496-16	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
numberOfData_i	UINT8, UINT16, UINT32, UINT64	
dim_i	UINT8, UINT16, UINT32, UINT64	
contextMask_i	UINT_8	
nValues_i	UINT8, UINT16, UINT32, UINT64	
values_i	INT8, INT16, INT32, INT64	
Output		
Name	**Token**	
validationMask_o	BOOLEAN	
nValues_o	UINT8, UINT16, UINT32, UINT64	
values_o	INT8, INT16, INT32, INT64	
flag_1_o	BOOLEAN	
flag_2_o	BOOLEAN	
flag_3_o	BOOLEAN	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part16		

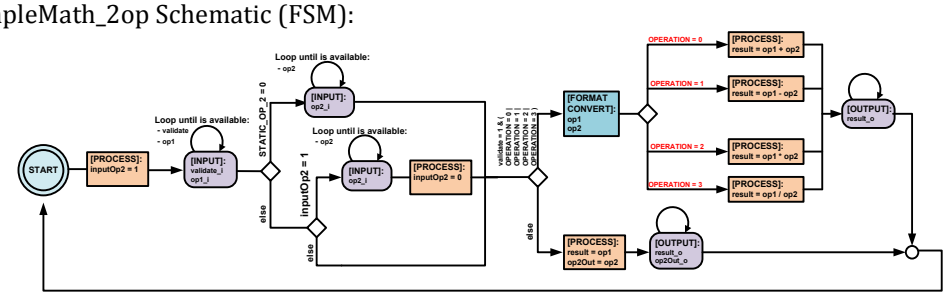
5.2.15 Algo_simpleMath_2op

FU Name	Algo_simpleMath_2op
Description	This FU describes the simple mathematical operation on 2 operands.



Port Name	Direction (I/O)	Token RANGE
op1_i	I	INT8, INT16, INT32, INT64, UINT8, UINT16, UINT32, UINT64, FLOAT
op2_i	I	INT8, INT16, INT32, INT64, UINT8, UINT16, UINT32, UINT64, FLOAT
validate_i	I	BOOLEAN
result_o	O	INT8, INT16, INT32, INT64, UINT8, UINT16, UINT32, UINT64, FLOAT
op2Out_o	O	INT8, INT16, INT32, INT64, UINT8, UINT16, UINT32, UINT64, FLOAT

simpleMath_2op Schematic (FSM):



simpleMath_2op process:

START
inputOp2 = 1
INPUT:
validate_i

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```
        op1_i
    IF STATIC_OP_2 = 0
        INPUT: op2_i
    ELSE
        IF inputOp2 = 1
            INPUT: op2_i
            inputOp2 = 0
    IF validate = 1 & ( OPERATION = 0 | OPERATION = 1 | OPERATION = 2 | OPERATION = 3 )
        FORMAT CONVERT: op1
        FORMAT CONVERT: op2
        SWITCH ( OPERATION )
            CASE 0:
                result = op1 + op2
                break
            CASE 1:
                result = op1 - op2
                break
            CASE 2:
                result = op1 * op2
                break
            CASE 3:
                result = op1 / op2
                break
        OUTPUT: result_o
    ELSE
        result = op1
        op2Out = op2
        OUTPUT: result_o
        OUTPUT: op2Out_o
    GOTO START
```

The following table contains the interpretation of the FORMAT codes:

FORMAT	Interpretation
0	Unsigned Integer
1	Signed Integer
2	Fixed Point
3	Floating Point (IEEE 754)

The following table contains the supported operations:

Index	Operation
0	Addition (+)
1	Substraction (-)
2	Multiplication (*)
3	Division (/)

NOTE If the validate_i flag is true (value 1), one of the operations above are applied to the 2 operands. Else, the operands are repeated at the output ports (result_o = op1 and op2Out_o = op2).

ISO Standards using the FU	ISO/IEC 14496-16	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
op1_i	INT8, INT16, INT32, INT64, UINT8, UINT16, UINT32, UINT64, FLOAT	
op2_i	INT8, INT16, INT32, INT64, UINT8, UINT16, UINT32, UINT64, FLOAT	
validate_i	BOOLEAN	
Output		
Name	**Token**	
result_o	INT8, INT16, INT32, INT64, UINT8, UINT16, UINT32, UINT64, FLOAT	
op2Out_o	INT8, INT16, INT32, INT64, UINT8, UINT16, UINT32, UINT64, FLOAT	
Parameter		
Name	**Description**	**Range**
FORMAT	Describes the input operands number format representation. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: {0,1,2,3}

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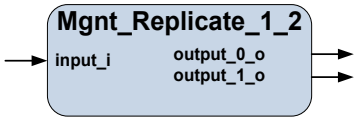
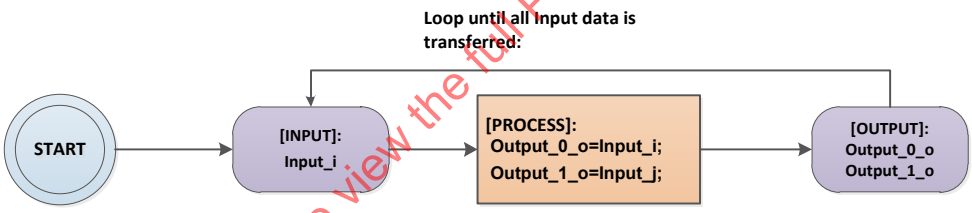
OPERATION	Describes the index of the operation to be applied. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: {0,1,2,3}
STATIC_OP_2	If it is set to 0, the FU expects that the input op2 will be read for each computation. If it is set to 1, the op 2 will be read just once and then used for any of the following operations. This parameter is set at the network configuration level.	Type:Unsigned Integer Range: {0,1}
Package		
package org.sc29.wg11.mpeg4.part16		

5.2.16 Mgnt_Replicate_1_2

FU Name	Mgnt_Replicate_1_2	
Description	The output is generated by replicating the transferred input data. The detailed process is described in the above FSM. Block diagram:  Ports description Port Constraints: - the output ports have to be of the same data type as the input port Process Schematic (FSM):  	
ISO Standards using the FU	ISO/IEC 14496-16	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
input_i	(Any type of token)	
Output		
Name	**Token**	
output_0_o	(Any type of token identical with input port)	
output_1_o	(Any type of token identical with input port)	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part16		

5.2.17 Mgnt_Replicate_1_4

FU Name	Mgnt_Replicate_1_4
Description	The output is generated by replicating the transferred input data. The detailed process is described in the above FSM.

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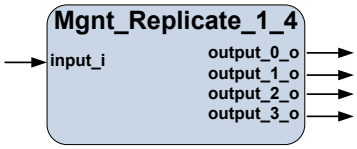
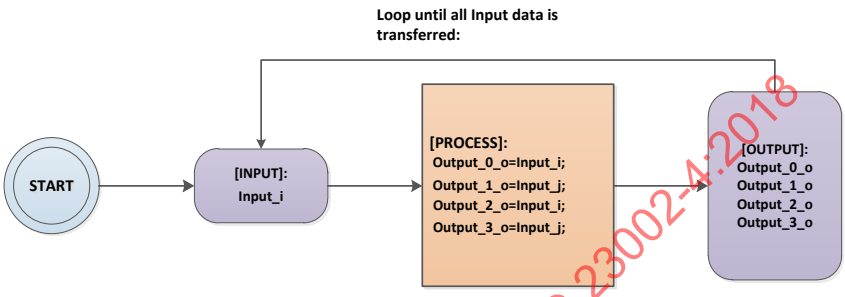
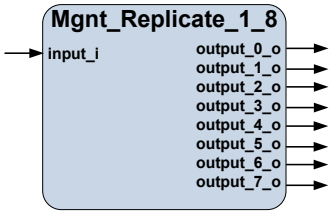
	Block diagram:  Ports description Port Constraints: - the output ports have to be of the same data type as the input port Process Schematic (FSM): 
ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Input	
Name	**Token**
input_i	(Any type of token)
Output	
Name	**Token**
output_0_o	(Any type of token identical with input port)
output_1_o	(Any type of token identical with input port)
output_2_o	(Any type of token identical with input port)
output_3_o	(Any type of token identical with input port)
Parameter	

Name	**Description**	**Range**

Package
package org.sc29.wg11.mpeg4.part16

5.2.18 Mgnt_Replicate_1_8

FU Name	Mgnt_Replicate_1_8
Description	The output is generated by replicating the transferred input data. The detailed process is described in the above FSM. Block diagram:  Ports description Port Constraints: - the output ports have to be of the same data type as the input port

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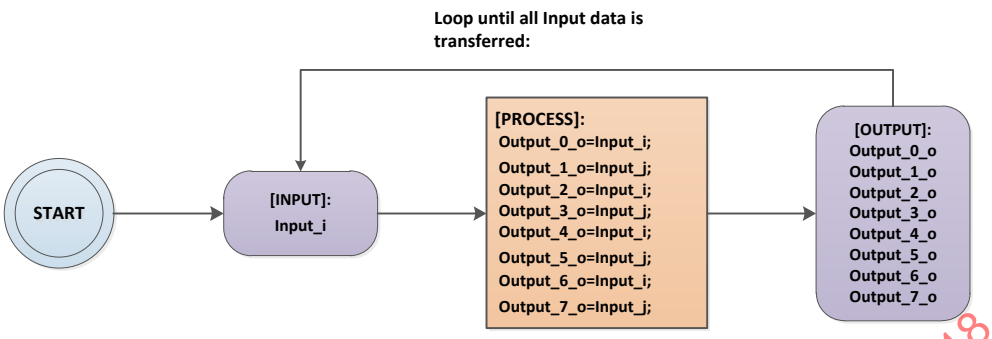
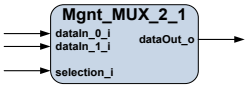
	Process Schematic (FSM): 
ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Input	
Name	**Token**
input_i	(Any type of token)
Output	
Name	**Token**
output_0_o	(Any type of token identical with input port)
output_1_o	(Any type of token identical with input port)
output_2_o	(Any type of token identical with input port)
output_3_o	(Any type of token identical with input port)
output_4_o	(Any type of token identical with input port)
output_5_o	(Any type of token identical with input port)
output_6_o	(Any type of token identical with input port)
output_7_o	(Any type of token identical with input port)
Parameter	

Name	**Description**	**Range**

Package
package org.sc29.wg11.mpeg4.part16

5.2.19 Mgnt_MUX_2_1

FU Name	Mgnt_MUX_2_1
Description	 Port Constraints: - the dataIn ports have to be of the same data type - the dataOut port has to be of the same data type as the dataIn input ports - the selection port is of type bit. MUX_2_1 Schematic (FSM):

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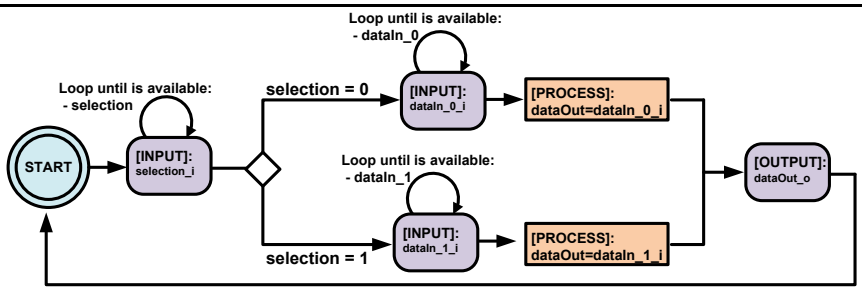
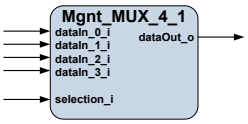
	 MUX_2_1 Process: START INPUT: selection SWITCH selection CASE 0: INPUT: dataIn_0_i dataOut = dataIn_0 CASE 1: INPUT: dataIn_1_i dataOut = dataIn_1 OUTPUT: dataOut_o GOTO START
ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Input	
Name	**Token**
datain_0_i	(Any type of token identical with dataOut_o port)
datain_1_i	(Any type of token identical with dataOut_o port)
Selection_i	BIT
Output	
Name	**Token**
dataOut_o	(Any type of token)
Parameter	
Name	**Description** / **Range**
Package	
package org.sc29.wg11.mpeg4.part16	

5.2.20 Mgnt_MUX_4_1

FU Name	Mgnt_MUX_4_1
Description	 Port Constraints: - the dataIn ports have to be of the same data type - the dataOut port has to be of the same data type as the dataIn input ports - the selection port is of type unsigned integer, represented on 2 bits. MUX_4_1 Schematic (FSM):

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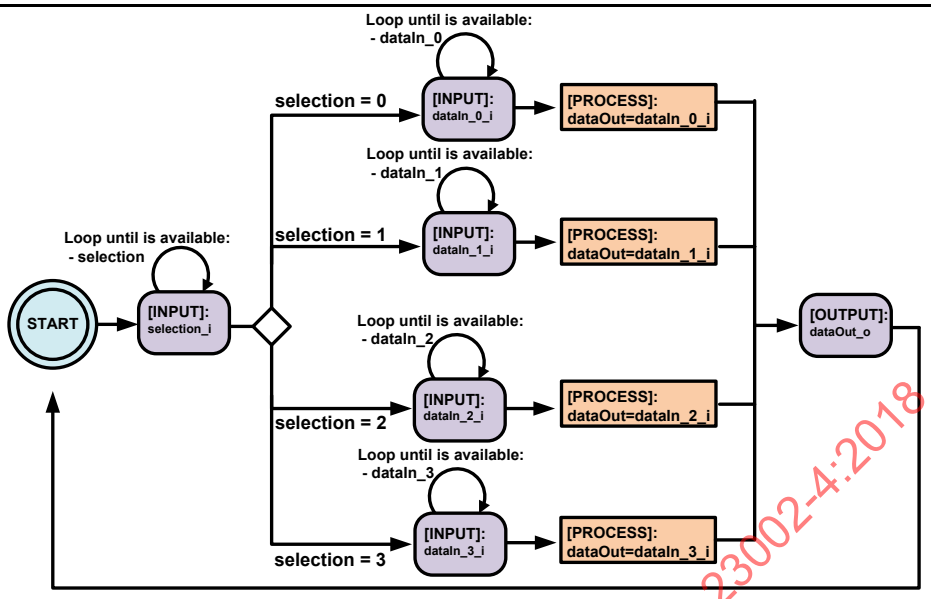

MUX_4_1 Process:

```
START
INPUT: selection
SWITCH selection
    CASE 0:
        INPUT: dataIn_0_i
        dataOut = dataIn_0
    CASE 1:
        INPUT: dataIn_1_i
        dataOut = dataIn_1
    CASE 2:
        INPUT: dataIn_2_i
        dataOut = dataIn_2
    CASE 3:
        INPUT: dataIn_3_i
        dataOut = dataIn_3
OUTPUT: dataOut_o
GOTO START
```

ISO Standards using the FU	ISO/IEC 14496-16	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
datain_0_i	(Any type of token identical with dataOut_o port)	
datain_1_i	(Any type of token identical with dataOut_o port)	
datain_2_i	(Any type of token identical with dataOut_o port)	
datain_3_i	(Any type of token identical with dataOut_o port)	
Selection_i	BIT	
Output		
Name	**Token**	
dataOut_o	(Any type of token)	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part16		

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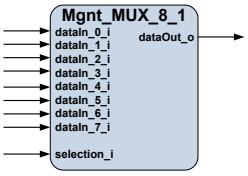
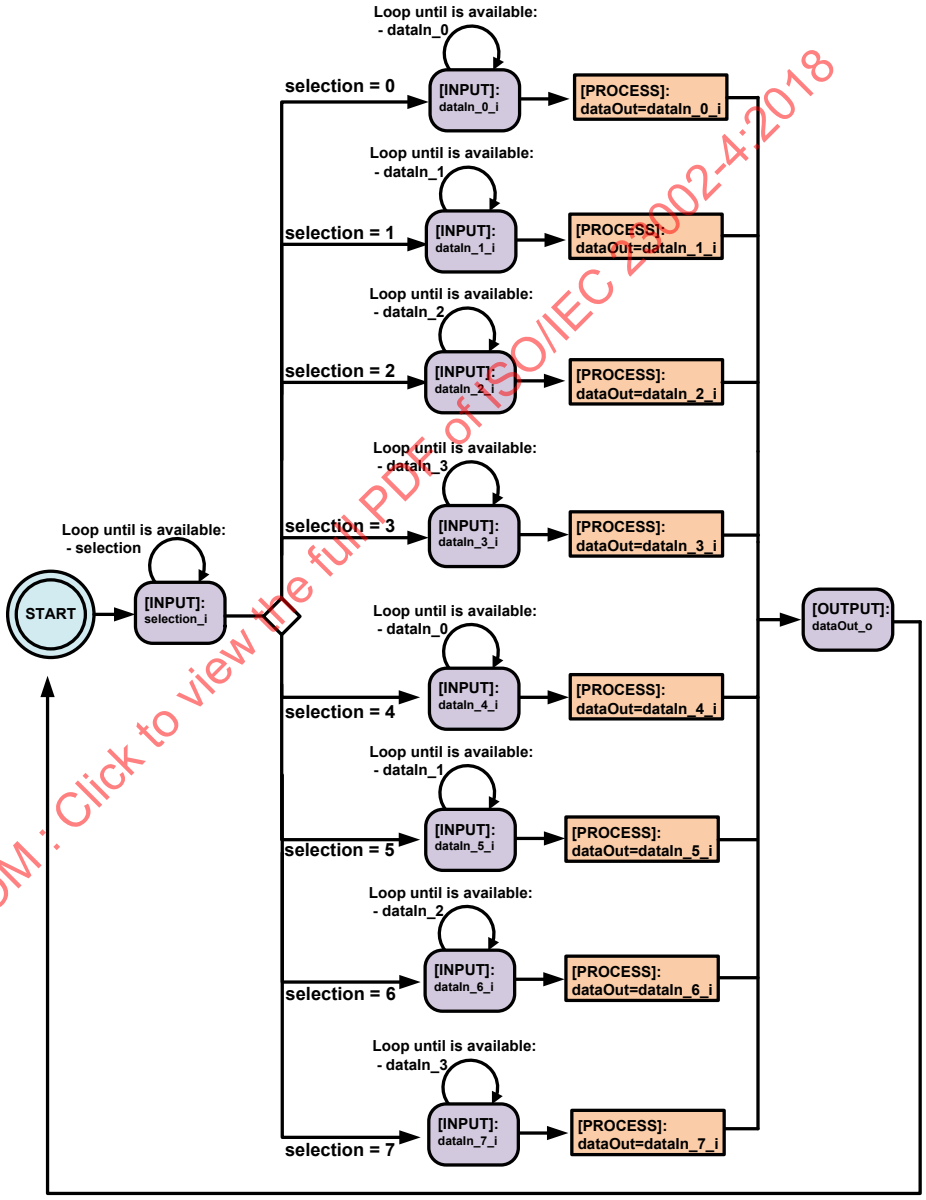
5.2.21 Mgnt_MUX_8_1

FU Name	Mgnt_MUX_8_1
Description	 Port Constraints: - the dataIn ports have to be of the same data type - the dataOut port has to be of the same data type as the dataIn input ports - the selection port is of type unsigned integer, represented on 3 bits. MUX_8_1 Schematic (FSM):  MUX_8_1 Process: START INPUT: selection SWITCH selection CASE 0: INPUT: dataIn_0_i dataOut = dataIn_0 CASE 1: INPUT: dataIn_1_i dataOut = dataIn_1 CASE 2:

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	INPUT: dataIn_2_i dataOut = dataIn_2 CASE 3: INPUT: dataIn_3_i dataOut = dataIn_3 CASE 4: INPUT: dataIn_4_i dataOut = dataIn_4 CASE 5: INPUT: dataIn_5_i dataOut = dataIn_5 CASE 6: INPUT: dataIn_6_i dataOut = dataIn_6 CASE 7: INPUT: dataIn_7_i dataOut = dataIn_7 OUTPUT: dataOut_o GOTO START
ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Input	
Name	**Token**
datain_0_i	(Any type of token identical with dataOut_o port)
datain_1_i	(Any type of token identical with dataOut_o port)
datain_2_i	(Any type of token identical with dataOut_o port)
datain_3_i	(Any type of token identical with dataOut_o port)
datain_4_i	(Any type of token identical with dataOut_o port)
datain_5_i	(Any type of token identical with dataOut_o port)
datain_6_i	(Any type of token identical with dataOut_o port)
datain_7_i	(Any type of token identical with dataOut_o port)
Selection_i	BIT
Output	
Name	**Token**
dataOut_o	(Any type of token)
Parameter	
Name	**Description** / **Range**
Package	
package org.sc29.wg11.mpeg4.part16	

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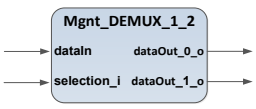
5.2.22 Mgnt_DEMUX_1_2

FU Name	Mgnt_DEMUX_1_2
Description	 Port Constraints: - the dataOut ports have to be of the same data type - the dataIn port has to be of the same data type as the dataOut ports - the selection port is of type bit. DEMUX_1_2 Schematic (FSM):

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	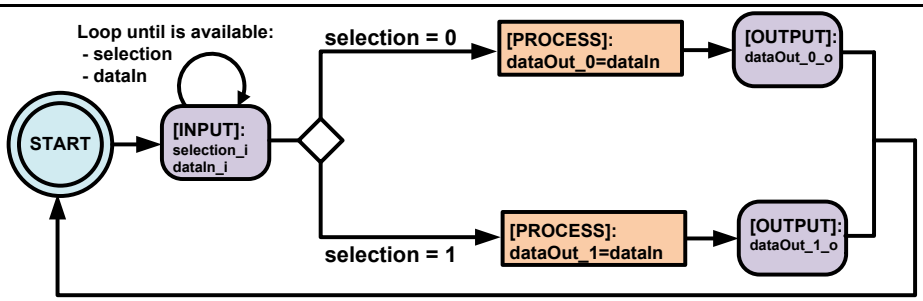 DEMUX_1_2 Process: START INPUT: selection INPUT: dataIn SWITCH selection CASE 0: dataOut_0 = dataIn OUTPUT: dataOut_0 CASE 1: dataOut_1 = dataIn OUTPUT: dataOut_1 GOTO START
ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Input	
Name	**Token**
dataIn	(Any type of token)
selection_i	BIT
Output	
Name	**Token**
dataOut_0_o	(Any type of token identical with dataIn port)
dataOut_1_o	(Any type of token identical with dataIn port)
Parameter	

Name	**Description**	**Range**

Package
package org.sc29.wg11.mpeg4.part16

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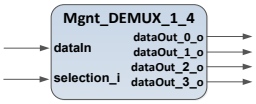
5.2.23 Mgnt_DEMUX_1_4

FU Name	Mgnt_DEMUX_1_4
Description	 Port Constraints: - the dataOut ports have to be of the same data type - the dataIn port has to be of the same data type as the dataOut ports - the selection port is of type unsigned integer represented on 2 bits. DEMUX_1_4 Schematic (FSM):

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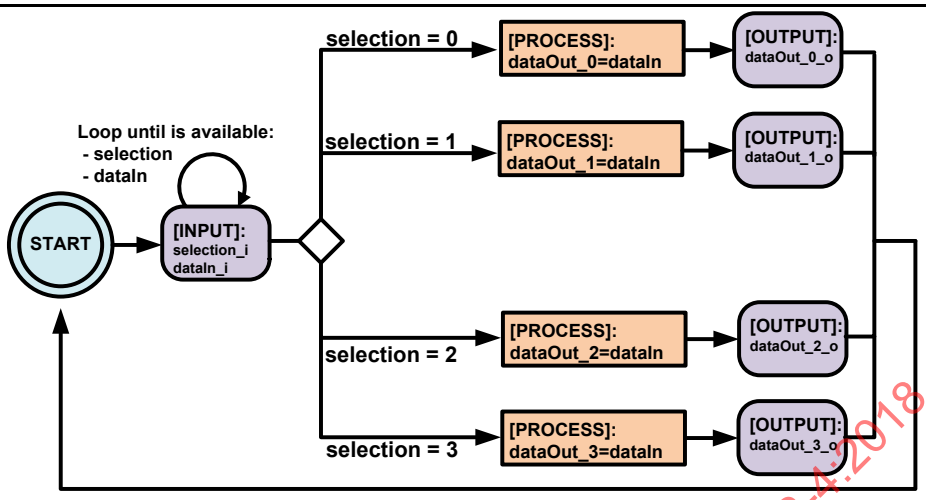

DEMUX_1_4 Process:

```
START
INPUT: selection
INPUT: dataIn
SWITCH selection
    CASE 0:
        dataOut_0 = dataIn
        OUTPUT: dataOut_0
    CASE 1:
        dataOut_1 = dataIn
        OUTPUT: dataOut_1
    CASE 2:
        dataOut_2 = dataIn
        OUTPUT: dataOut_2
    CASE 3:
        dataOut_3 = dataIn
        OUTPUT: dataOut_3
GOTO START
```

ISO Standards using the FU	ISO/IEC 14496-16	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
dataIn	(Any type of token)	
selection_i	BIT	
Output		
Name	**Token**	
dataOut_0_o	(Any type of token identical with dataIn port)	
dataOut_1_o	(Any type of token identical with dataIn port)	
dataOut_2_o	(Any type of token identical with dataIn port)	
dataOut_3_o	(Any type of token identical with dataIn port)	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part16		

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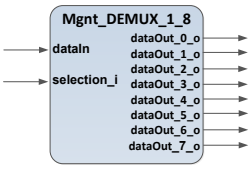
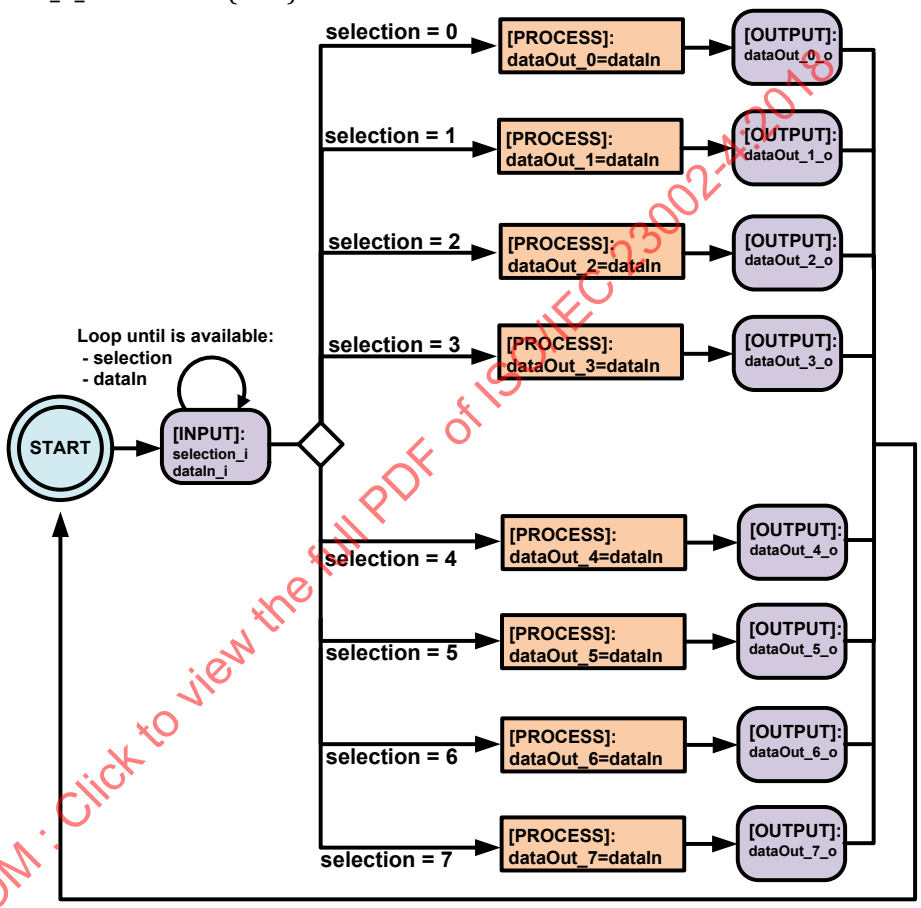
5.2.24 Mgnt_DEMUX_1_8

FU Name	Mgnt_DEMUX_1_8
Description	 Port Constraints: - the dataOut ports have to be of the same data type - the dataIn port has to be of the same data type as the dataOut ports - the selection port is of type unsigned integer represented on 3 bits. DEMUX_1_8 Schematic (FSM):  DEMUX_1_8 Process: START INPUT: selection INPUT: dataIn SWITCH selection CASE 0: dataOut_0 = dataIn OUTPUT: dataOut_0 CASE 1: dataOut_1 = dataIn OUTPUT: dataOut_1 CASE 2: dataOut_2 = dataIn OUTPUT: dataOut_2 CASE 3: dataOut_3 = dataIn OUTPUT: dataOut_3 CASE 4: dataOut_4 = dataIn OUTPUT: dataOut_4 CASE 5: dataOut_5 = dataIn OUTPUT: dataOut_5

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	CASE 6: dataOut_6 = dataIn OUTPUT: dataOut_6 CASE 7: dataOut_7 = dataIn OUTPUT: dataOut_7 GOTO START
ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Input	
Name	**Token**
dataIn	(Any type of token)
selection_i	BIT
Output	
Name	**Token**
dataOut_0_o	(Any type of token identical with dataIn port)
dataOut_1_o	(Any type of token identical with dataIn port)
dataOut_2_o	(Any type of token identical with dataIn port)
dataOut_3_o	(Any type of token identical with dataIn port)
dataOut_4_o	(Any type of token identical with dataIn port)
dataOut_5_o	(Any type of token identical with dataIn port)
dataOut_6_o	(Any type of token identical with dataIn port)
dataOut_7_o	(Any type of token identical with dataIn port)
Parameter	

Name	**Description**	**Range**

Package
package org.sc29.wg11.mpeg4.part16

5.2.25 Mgnt_ExtractSegment

FU Name	Mgnt_ExtractSegment
Description	This FU extracts a piece of data from the input of size embedded in the input data, outputs the size of the segment, the segment data and repeats the rest of the input on the output port. The size of the segment is embedded in the beginning of the input data and it is represented using a number of sizeBytes of type unsigned integer. The computed size is outputted as unsigned integer on the extractedDataSize_o output port, the extracted data segment is outputted on the extractedDataOut_o port and the rest of the input data is repeated on the repeatedDataOut_o port. EXAMPLE

extractedDataSize	extractedData	repeatedData
size = sizeBytes	size = extractedDataSize	size = rest of input

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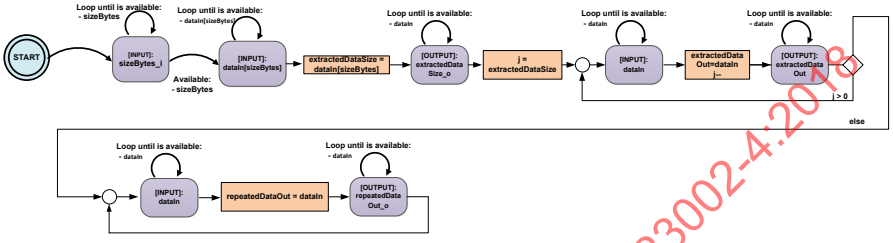
Port Name	Direction (I/O)	Token RANGE
dataIn_i	I	UINT8, UINT16, UINT32, UINT64
sizeBytes_i	I	UINT8, UINT16, UINT32, UINT64
extractedDataOut_o	O	UINT8, UINT16, UINT32, UINT64
extractedDataSize_o	O	UINT8, UINT16, UINT32, UINT64
repeatedDataOut_o	O	UINT8, UINT16, UINT32, UINT64



ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)

Input	
Name	**Token**
dataIn_i	UINT8, UINT16, UINT32, UINT64
sizeBytes_i	UINT8, UINT16, UINT32, UINT64

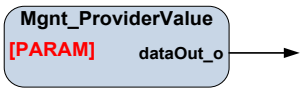
Output	
Name	**Token**
extractedDataOut_o	UINT8, UINT16, UINT32, UINT64
extractedDataSize_o	UINT8, UINT16, UINT32, UINT64
repeatedDataOut_o	UINT8, UINT16, UINT32, UINT64

Parameter		
Name	**Description**	**Range**

Package

package org.sc29.wg11.mpeg4.part16

5.2.26 Mgnt_ProviderValue

FU Name	Mgnt_ProviderValue
Description	

Port Name	Direction (I/O)	Token RANGE
dataOut_o	O	UINT8, UINT16, UINT32, UINT64

ProviderValue Process Schematic (FSM):

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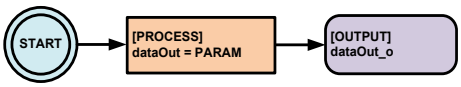
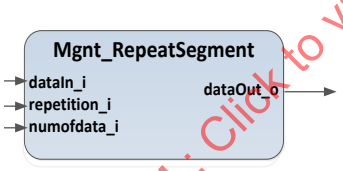
	 ProviderValue Process: START: dataOut = PARAM OUTPUT: dataOut_o
ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Output	
Name	**Token**
dataOut_o	UINT8, UINT16, UINT32, UINT64
Parameter	
Name	**Description** / **Range**
PARAM	Describes the value of the parameter that is outputted one time as dataOut. It is set at the network configuration level.
Package	
package org.sc29.wg11.mpeg4.part16	

5.2.27 Mgnt_RepeatSegment

FU Name	Mgnt_RepeatSegment
Description	This FU describes how to repetitively transfer the given data.  Port Name / Direction (I/O) / Token RANGE dataIn_i / I / UINT8, UINT16, UINT32, UINT64 repetition_i / I / UINT8, UINT16, UINT32, UINT64 numofdata_i / I / UINT8, UINT16, UINT32, UINT64 dataOut_o / O / UINT8, UINT16, UINT32, UINT64 RepeatSegment Process Schematic (FSM):

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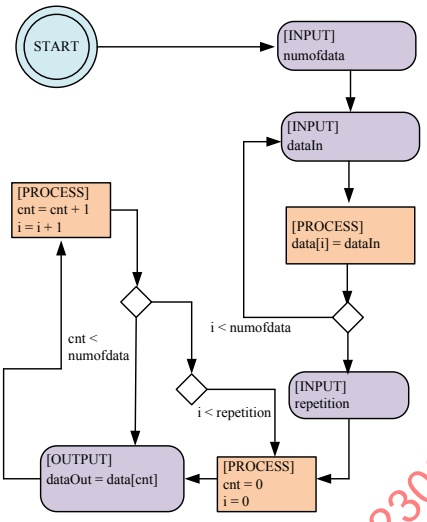

RepeatSegment Process:

```
START:
    INPUT: numofdata
    WHILE i < numofdata
      INPUT: dataIn
      data[i] = dataIn
    INPUT: repetition
    WHILE i < repetition
      WHILE cnt < numofdata
        dataOut = data[cnt]
        OUTPUT: dataOut
```

ISO Standards using the FU	ISO/IEC 14496-16	
Profiles@levels supported	All (Generic)	
Input		
Name	**Token**	
dataIn_i	UINT8, UINT16, UINT32, UINT64	
repetition_i	UINT8, UINT16, UINT32, UINT64	
numofdata_i	UINT8, UINT16, UINT32, UINT64	
Output		
Name	**Token**	
dataOut_o	UINT8, UINT16, UINT32, UINT64	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part16		

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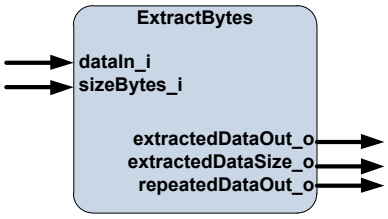
5.2.28 Mgnt_ExtractBytes

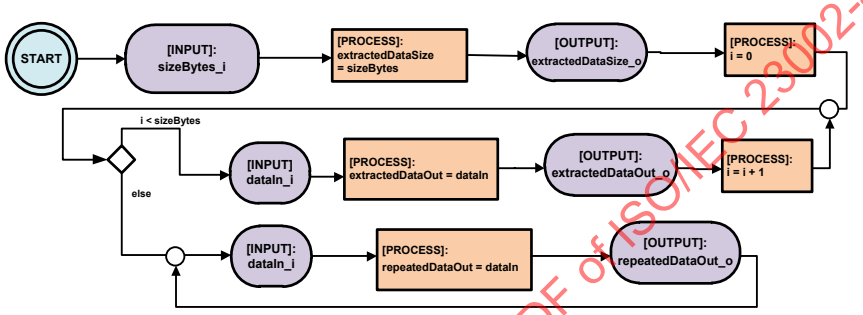
FU Name: Mgnt_ExtractBytes

Description



Port Name	Direction (I/O)	Token RANGE
dataIn_i	I	UINT8, UINT16, UINT32, UINT64
sizeBytes_i	I	UINT8, UINT16, UINT32, UINT64
extractedDataOut_o	O	UINT8, UINT16, UINT32, UINT64
repeatedDataOut_o	O	UINT8, UINT16, UINT32, UINT64
extractedDataSize_o	O	UINT8, UINT16, UINT32, UINT64

Mgnt_ExtractBytes Schematic:



Mgnt_ExtractBytes Process:

```
START:
    INPUT:
        sizeBytes_i
    extractedDataSize = sizeBytes
    OUTPUT:
        extractedDataSize_o
    i = 0
    EXTRACT_DATA
    IF i < sizeBytes
        INPUT:
            dataIn_i
        extractedDataOut = dataIn;
        OUTPUT:
            extractedDataOut_o
        i = i + 1
        GOTO EXTRACT_DATA
    REPEATED_DATA
    INPUT:
        dataIn_i
    repeatedDataOut = dataIn;
    OUTPUT:
        repeatedDataOut_o
    GOTO REPEATED_DATA
```

ISO Standards using the FU: ISO/IEC 14496-16

Profiles@levels supported: All (Generic)

Input

Name	Token
dataIn_i	UINT8, UINT16, UINT32, UINT64
sizeBytes_i	UINT8, UINT16, UINT32, UINT64

Output

Name	Token
extractedDataOut_o	UINT8, UINT16, UINT32, UINT64
repeatedDataOut_o	UINT8, UINT16, UINT32, UINT64

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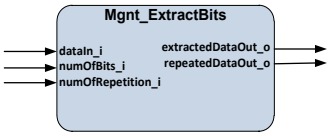
extractedDataSize_o	UINT8, UINT16, UINT32, UINT64	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part16		

5.2.29 Mgnt_ExtractBits

FU Name: Mgnt_ExtractBits

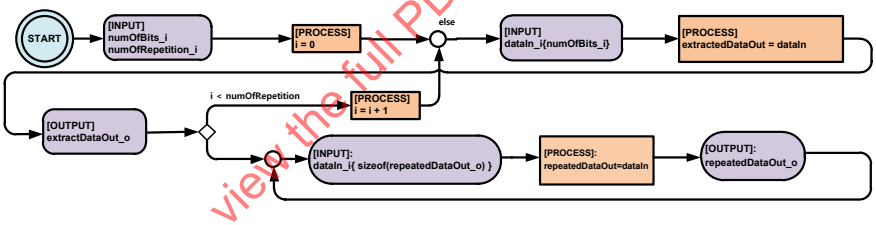
Description:

This FU describes how to repetitively extract a given number of bits and output the values, sequentially. The rest of the input data is repeated at the output port. Internally, the bit alignment is done after finishing the bits extraction operation.



Port Name	Direction (I/O)	Token RANGE
dataIn_i	I	UINT8, UINT16, UINT32, UINT64
numOfBits_i	I	UINT8, UINT16, UINT32, UINT64
numOfRepetition_i	I	UINT8, UINT16, UINT32, UINT64
extractedValuesOut_o	O	UINT8, UINT16, UINT32, UINT64
repatedDataOut_o	O	UINT8, UINT16, UINT32, UINT64

ExtractBits Process Schematic (FSM):



ExtExtractBits Process:

```
START:
INPUT:
    numOfBits_i
    numOfRepetition_i
i = 0
EXTRACT BITS
INPUT:
    dataIn_i{numOfBits}
    extractedDataOut = dataIn
OUTPUT:
    extractedDataOut_o

IF i < numOfRepetition
    i++
    GOTO EXTRACT BITS

REPEATED_DATA_OUT
INPUT:
    dataIn_i{ sizeof (repeatedDataOut) }
repeatedDataOut = dataIn
OUTPUT:
    repeatedDataOut_o
GOTO REPEATED_DATA_OUT
```

NOTE The “sizeof” operation is used to obtain the size of the token in bits (bus width). The way to use the “sizeof” operation is as follows:

— sizeof(name of port).

ISO Standards using the FU: ISO/IEC 14496-16

Profiles@levels: All (Generic)

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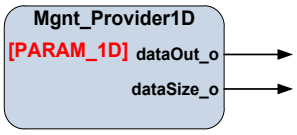
supported		
Input		
Name	**Token**	
dataIn_i	UINT8, UINT16, UINT32, UINT64	
repetition_i	UINT8, UINT16, UINT32, UINT64	
numOfRepetition_i	UINT8, UINT16, UINT32, UINT64	
Output		
Name	**Token**	
extractedValuesOut_o	UINT8, UINT16, UINT32, UINT64	
repatedDataOut_o	UINT8, UINT16, UINT32, UINT64	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part16		

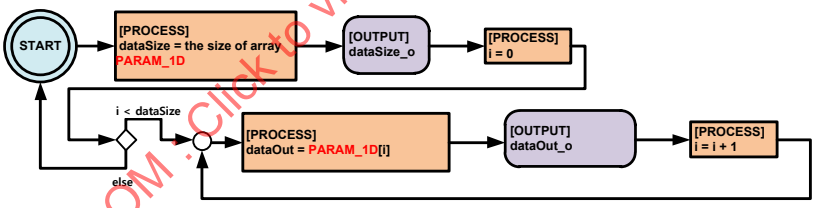
5.2.30 Mgnt_Provider1D

FU Name	Mgnt_Provider1D
Description	This FU describes how to provide 1D array values from FU network description.



Port Name	Direction (I/O)	Token RANGE
dataOut_o	O	UINT8, UINT16, UINT32, UINT64
dataSize_o	O	UINT8, UINT16, UINT32, UINT64

Provider1D Process Schematic (FSM):



Provider1D Process:

```
START:
  dataSize = the size of array PARAM_1D
  OUTPUT:
    dataSize_o
  i = 0
  // READ 1D TABLE
  IF i < dataSize
    dataOut = PARAM_1D[i]
      OUTPUT:
     dataOut_o
    i = i + 1
    GOTO READ 1D TABLE
```

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)
Output	
Name	**Token**

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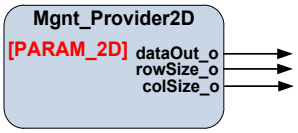
dataOut_o	UINT8, UINT16, UINT32, UINT64	
dataSize_o	UINT8, UINT16, UINT32, UINT64	
Parameter		
Name	**Description**	**Range**
PARAM_1D	It is stored internally as an array, loaded at the network configuration stage.	{[0, 2^{32}-1], ..., [0, 2^{32}-1]}
Package		
package org.sc29.wg11.mpeg4.part16		

5.2.31 Mgnt_Provider2D

FU Name: Mgnt_Provider2D

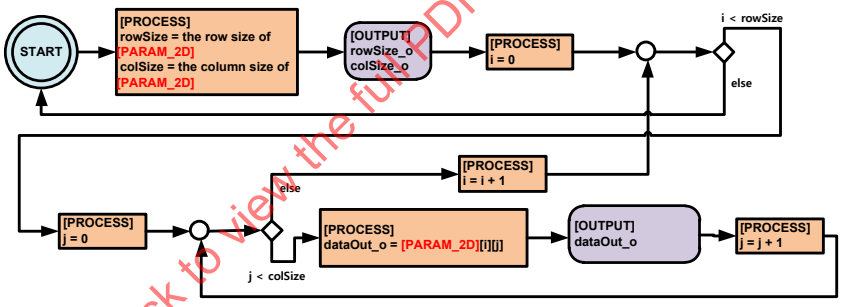
Description

This FU describes how to provide 2D values in the row-base manner.



Port Name	Direction (I/O)	Token RANGE
dataOut_o	O	UINT8, UINT16, UINT32, UINT64
rowSize_o	O	UINT8, UINT16, UINT32, UINT64
colSize_o	O	UINT8, UINT16, UINT32, UINT64

Provider2D Process Schematic (FSM):



Provider2D Process:

```
START:
    rowSize = the row size of 2-dimensional array PARAM_2D
    colSize = the column size of 2-dimensional array PARAM_2D
    OUTPUT:
      rowSize_o
      colSize_o
    i = 0
    ROW_LOOP
    IF i < rowSize
      j = 0
      COL_LOOP
      IF i < colSize
            dataOut = PARAM_2D[i][j]
             OUTPUT:
                  dataOut_o
      j = j + 1
      GOTO COL_LOOP
      ELSE
              i = i + 1
         GOTO ROW_LOOP
    ELSE GOTO START
```

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	All (Generic)

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Output		
Name	**Token**	
dataOut_o	UINT8, UINT16, UINT32, UINT64	
rowSize_o	UINT8, UINT16, UINT32, UINT64	
colSize_o	UINT8, UINT16, UINT32, UINT64	
Parameter		
Name	**Description**	**Range**
PARAM_2D	It is stored internally as 2-dimensional array, loaded at the network configuration stage.	{{[0, 2^{32}-1], ..., [0, 2^{32}-1]}, {[0, 2^{32}-1], ..., [0, 2^{32}-1]} ... {[0, 2^{32}-1], ..., [0, 2^{32}-1]}}
Package		
package org.sc29.wg11.mpeg4.part16		

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6 FUs for MPEG-4 Simple Profile

6.1 General

FUs for building MPEG-4 Simple Profile decoder are described in this clause.

6.2 Syntax parsing

6.2.1 Algo_SynP

FU Name	Algo_SynP	
Description	This module is parsing all syntax element from an MPEG-4 Simple Profile (SP) bitstream.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
BITS	BIT token	
Output		
Name	**Token**	
ROUND	ROUND token	
F_CODE	F_CODE token	
MV	MV token	
RUN	RUN token	
VALUE	VALUE token	
LAST	LAST token	
WIDTH	WIDTH token	
HEIGHT	HEIGHT token	
QP	QUANT token	
ACCODED	ACCODED token	
MOTION	MOTION token	
ACPRED	ACPRED token	
BTYPE	BTYPE token	
FOURMV	FOURMV token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser		

6.2.2 Mgnt_BlockExpand

FU Name	Mgnt_BlockExpand	
Description	This module is composing a 8×8 block with RUN, VALUE and LAST syntax elements from the parser.	
Profiles@levels supported		
Input		
Name	**Token**	
RUN	RUN token	
VALUE	VALUE token	
LAST	LAST token	
Output		
Name	**Token**	

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OUT	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser		

6.2.3 Mgnt_Splitter420B

FU Name	Mgnt_Splitter420B	
Description	This module split each 8×8 block in 4 Y, 1 U and 1V depending on ACCODED and the BTYPE values.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
B	BLOCK token	
ACCODED	ACCODED token	
BTYPE	BTYPE token	
Output		
Name	**Token**	
B_Y	BLOCK token	
B_U	BLOCK token	
B_V	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser		

6.2.4 Mgnt_Splitter420MV

FU Name	Mgnt_SplitterMV	
Description	This module split each 6 MV token in 4 Y, 1 U and 1V when MOTION is true.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
MV	MV token	
MOTION	MOTION token	
Output		
Name	**Token**	
MV_Y	MV token	
MV_U	MV token	
MV_V	MV token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser		

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6.2.5 Algo_MVR_MedianOfThreeLeftAndTopAndTopRight

FU Name	Algo_MVSequence_LeftAndTopAndTopRight	
Description	This module computes the sequence of coordinates of the different blocks necessary for the prediction of the motion vectors. From the type of encoding of the block (given by the FOURMV, MOTION, VOPMODE, and WIDTH), the FU generates the coordinates of the blocks (on the A port) which will be used by the FU charged of reconstructing the motion vectors for each 8×8 block.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
FOURMV	FOURMV token	
MOTION	MOTION token	
BTYPE	BTYPE token	
WIDTH	WIDTH token	
Output		
Name	**Token**	
A	COORDINATE token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser		

6.2.6 Mgnt_Splitter_420_TYPE

FU Name	Mgnt_Splitter_420_TYPE
Description	This module distributes each VOPMODE, ACCODED, ACPRED, and MOTION for each Y, U, and V components sequentially.
Profiles@levels supported	MPEG-4 SP
Input	
Name	**Token**
BTYPE	BTYPE token
MOTION	MOTION token
ACCODED	ACCODED token
ACPRED	ACPRED token
QP	QUANT token
Output	
Name	**Token**
BTYPE_Y	BTYPE token
BTYPE_U	BTYPE token
BTYPE_V	BTYPE token
MOTION_Y	MOTION token
MOTION_U	MOTION token
MOTION_V	MOTION token
ACCODED_Y	ACCODED token
ACCODED_U	ACCODED token
ACCODED_V	ACCODED token
ACPRED_Y	ACPRED token
ACPRED_U	ACPRED token
ACPRED_V	ACPRED token

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QP_Y	QUANT token	
QP_U	QUANT token	
QP_V	QUANT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser		

6.2.7 Algo_VLDtableB6_MPEG4Part2

FU Name	Algo_VLDtableB6_MPEG4Part2	
Description	This Functional Unit decodes the mcbpc element of syntax of an MPEG-4 part 2 conforming bitstream. It is in the case of intra mode. It decodes the bits according to ISO/IEC 14496-2:2004, Table B.6.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
BITS	BIT token	
Output		
Name	**Token**	
FINISH	ACKNOWLEDGMENT token	
DATA	MCBPC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser.vlc		

6.2.8 Algo_VLDtableB7_MPEG4Part2

FU Name	Algo_VLDtableB7_MPEG4Part2	
Description	This Functional Unit decodes the mcbpc element of syntax of an MPEG-4 conforming bitstream. It is in the case of inter mode. It decodes the bits according to ISO/IEC 14496-2:2004, Table B.7.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
BITS	BIT token	
Output		
Name	**Token**	
FINISH	ACKNOWLEDGMENT token	
DATA	MCBPC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser.vlc		

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6.2.9 Algo_VLDtableB8_MPEG4Part2

FU Name	Algo_VLDtableB8_MPEG4Part2	
Description	This Functional Unit decodes the cbpy element of syntax of an MPEG-4 conforming bitstream. It decodes the bits according to ISO/IEC 14496-2:2004, Table B.8.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
BITS	BIT token	
Output		
Name	**Token**	
FINISH	ACKNOWLEDGMENT token	
DATA	CBPY token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser.vlc		

6.2.10 Algo_VLDtableB12_MPEG4Part2

FU Name	Algo_VLDtableB12_MPEG4Part2	
Description	This Functional Unit decodes the elements of syntax relative to the motion vectors in an MPEG-4 conformant bitstream ("horizontal_mv_data" and "vertical_mv_data"). It decodes the bits according to ISO/IEC 14496-2:2004, Table B.12.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
BITS	BIT token	
Output		
Name	**Token**	
FINISH	ACKNOWLEDGMENT token	
DATA	MVD token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser.vlc		

6.2.11 Algo_VLDtableB13_MPEG4Part2

FU Name	Algo_VLDtableB13_MPEG4Part2
Description	This Functional Unit decodes the "dct_dc_size" element of syntax in an MPEG-4 conforming bitstream. The decoding applies only for the luminance macroblocks. It decodes the bits according to ISO/IEC 14496-2:2004, Table B.13.
Profiles@levels supported	MPEG-4 SP
Input	
Name	**Token**
BITS	BIT token

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Output		
Name	**Token**	
FINISH	ACKNOWLEDGMENT token	
DATA	DCT_DC_SIZE token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser.vlc		

6.2.12 Algo_VLDtableB14_MPEG4Part2

FU Name	Algo_VLDtableB14_MPEG4Part2	
Description	This Functional Unit decodes the "dct_dc_size" element of syntax in an MPEG-4 conforming bitstream. The decoding applies only for the chrominance macroblocks. It decodes the bits according to ISO/IEC 14496-2:2004, Table B.14.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
BITS	BIT token	
Output		
Name	**Token**	
FINISH	ACKNOWLEDGMENT token	
DATA	DCT_DC_SIZE token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser.vlc		

6.2.13 Algo_VLDtableB15_MPEG4Part2

FU Name	Algo_VLDtableB15_MPEG4Part2	
Description	This Functional Unit decodes the "dct_dc_differencial" element of syntax in an MPEG-4 conforming bitstream. It decodes the bits according to ISO/IEC 14496-2:2004, Table B.15.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
BITS	BIT token	
Output		
Name	**Token**	
FINISH	ACKNOWLEDGMENT token	
DATA	DCT_DC_DIFF token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser.vlc		

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6.2.14 Algo_VLDtableB16_MPEG4Part2

FU Name	Algo_VLDtableB16_MPEG4Part2	
Description	This Functional Unit decodes the INTRA coefficients as elements of syntax in an MPEG-4 conforming bitstream. It decodes the bits according to ISO/IEC 14496-2:2004, Table B.16.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
BITS	BIT token	
Output		
Name	**Token**	
FINISH	ACKNOWLEDGMENT token	
RUN	RUN token	
VALUE	VALUE token	
LAST	LAST token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser.vlc		

6.2.15 Algo_VLDtableB17_MPEG4Part2

FU Name	Algo_VLDtableB17_MPEG4Part2	
Description	This Functional Unit decodes the INTER coefficients as elements of syntax in an MPEG-4 conforming bitstream. It decodes the bits according to ISO/IEC 14496-2:2004, Table B.16.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
BITS	BIT token	
Output		
Name	**Token**	
FINISH	ACKNOWLEDGMENT token	
RUN	RUN token	
VALUE	VALUE token	
LAST	LAST token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.parser.vlc		

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6.3 Texture decoding

6.3.1 Algo_IQ_QSAndQmatrixMp4vOrH263Scaler

FU Name	Algo_IQ_QSAndQmatrixMp4vOrH263Scaler	
Description	This module computes inverse quantization of AC for 8×8 blocks. Supports both MPEG and H.263 Inverse Quantization modes.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
DC	DC token	
AC	AC token	
QP	QUANT token	
Output		
Name	**Token**	
OUT	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.texture		

6.3.2 Algo_DCRAddr_ThreeLeftTop_8x8

FU Name	Algo_DCRAddr_ThreeLeftTop_8x8	
Description	This module calculates the addresses of the three neighboring blocks for the current 8×8 block used for DC prediction. If any of the neighbors is not coded for some reason (either outside frame boundaries or skipped by encoder), the address is set as zero. Otherwise the lowest two bits specify the 8×8 component in the macroblock and the other higher order bits specify the macroblock index using circular buffer addressing.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
BTYPE	BTYPE token	
WIDTH	WIDTH token	
Output		
Name	**Token**	
A	COORDINATE token	
B	COORDINATE token	
C	COORDINATE token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction		

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6.3.3 Algo_DCRAddr_ThreeLeftTop_16x16

FU Name	Algo_DCRAddr_ThreeLeftTop_16x16	
Description	This module calculates the addresses of the three neighboring blocks for the current 8×8 block used for DC prediction. This module manages groups of four 8×8 blocks as follows: +---+---+ | 0 | 1 | +---+---+ | 2 | 3 | +---+---+ If any of the neighbors is not coded for some reason (either outside frame boundaries or skipped by encoder), the address is set as zero. Otherwise the lowest two bits specify the 8×8 component in the macroblock and the other higher order bits specify the macroblock index using circular buffer addressing.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
BTYPE	BTYPE token	
WIDTH	WIDTH token	
Output		
Name	**Token**	
A	COORDINATE token	
B	COORDINATE token	
C	COORDINATE token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction		

6.3.4 Algo_DCRInvPred_CHROMA_8x8

FU Name	Algo_DCRInvPred_CHROMA_8x8
Description	This module reconstructs the DC coefficient of the current 8×8 block based on the gradients between neighboring block DC coefficients (see ISO/IEC 14496-2). This module also forwards the decoded prediction direction to the inverse AC prediction (IAP) module and a pointer to the neighboring block used for the prediction. Since inverse quantization is necessary to reconstruct the DC coefficient, the decoded quantization parameter is forwarded to the inverse quantization module. This FU applies for 8×8 blocks of chrominance.
Profiles@levels supported	MPEG-4 SP
Input	
Name	**Token**
A	COORDINATE token
B	COORDINATE token
C	COORDINATE token
ACCODED	ACCODED token
ACPRED	ACPRED token
QFS_DC	DC token
QP	QUANT token
BTYPE	BTYPE token

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WIDTH	WIDTH token	
Output		
Name	**Token**	
QF_DC	DC token	
PTR	COORDINATE token	
AC_PRED_DIR	ACPRED_DIR token	
SIGNED	SIGN token	
QUANT	QUANT token	
PREV_QUANT	QUANT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction		

6.3.5 Algo_DCRInvPred_LUMA_16x16

FU Name	Algo_DCRInvPred_LUMA_16x16	
Description	This module reconstructs the DC coefficient of the current 8×8 block based on the gradients between neighboring block DC coefficients (see ISO/IEC 14496-2). This module also forwards the decoded prediction direction to the inverse AC prediction (IAP) module and a pointer to the neighboring block used for the prediction. Since inverse quantization is necessary to reconstruct the DC coefficient, the decoded quantization parameter is forwarded to the inverse quantization module. This FU applies for four 8×8 blocks of luminance.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
A	COORDINATE token	
B	COORDINATE token	
C	COORDINATE token	
ACCODED	ACCODED token	
ACPRED	ACPRED token	
QFS_DC	DC token	
QP	QUANT token	
BTYPE	BTYPE token	
WIDTH	WIDTH token	
Output		
Name	**Token**	
QF_DC	DC token	
PTR	COORDINATE token	
AC_PRED_DIR	ACPRED_DIR token	
SIGNED	SIGN token	
QUANT	QUANT token	
PREV_QUANT	QUANT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction		

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6.3.6 Algo_IS_ZigzagOrAlternateHorizontalVertical_8x8

FU Name	Algo_IS_ZigzagOrAlternateHorizontalVertical_8x8	
Description	This module inverts the one-dimensional array of coefficients ordered in zigzag (AC_PRED_DIR=0), alternate vertical (AC_PRED_DIR=1) or alternate horizontal (AC_PRED_DIR=2) scan to 2D raster order. It inputs a list of 64 integer coefficients (one per 8×8 block) and outputs the ordered list of integer according to the value of the token AC_PRED_DIR.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
AC_PRED_DIR	ACPRED_DIR token	
QFS_AC	AC token	
Output		
Name	**Token**	
PQF_AC	AC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.texture		

6.3.7 Algo_IAP_AdaptiveHorizontalOrVerticalPred_8x8

FU Name	Algo_IAP_AdaptiveHorizontalOrVerticalPred_8x8	
Description	This module computes inverse AC prediction for specific AC coefficients of 8×8 blocks that have been flagged in the bitstream as coded in this fashion. It inputs a list of 63 AC coefficients received in a horizontal raster manner after being re-ordered by the inverse scan block and the addresses of the 8×8 block used for the prediction in the encoder. It outputs a list of 63 reconstructed AC coefficients sent in a horizontal raster man. The AC_PRED_DIR token communicates the direction of prediction: — AC_PRED_DIR = -2 => NEWVOP flag — AC_PRED_DIR = -1 => An un-coded block so skip inverse AC prediction — AC_PRED_DIR = 0 => No inverse AC prediction but use zigzag inverse scan — AC_PRED_DIR = 1 => Prediction form the left and use alternate vertical scan — AC_PRED_DIR = 2 => Prediction form the top and use alternate horizontal scan	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
PQF_AC	AC token	
PTR	COORDINATE token	
AC_PRED_DIR	ACPRED_DIR token	
QP	QUANT token	
PREV_QP	QUANT token	
Output		
Name	**Token**	
QF_AC	AC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.texture		

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6.3.8 Algo_IAP_AdaptiveHorizontalOrVerticalPred_16x16

FU Name	Algo_IAP_AdaptiveHorizontalOrVerticalPred_16x16	
Description	This module computes inverse AC prediction for specific AC coefficients of a 16×16 blocks that have been flagged in the bitstream as coded in this fashion. It inputs four lists of 63 AC coefficients received in a horizontal raster manner after being re-ordered by the inverse scan block and the addresses of the four 8×8 block used for the prediction in the encoder. It outputs four lists of 63 reconstructed AC coefficients sent in a horizontal raster man. The AC_PRED_DIR token communicates the direction of prediction: — AC_PRED_DIR = -2 => NEWVOP flag — AC_PRED_DIR = -1 => An un-coded block so skip inverse AC prediction — AC_PRED_DIR = 0 => No inverse AC prediction but use zig zag inverse scan — AC_PRED_DIR = 1 => Prediction form the left and use alternate vertical scan — AC_PRED_DIR = 2 => Prediction form the top and use alternate horizontal scan	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
PQF_AC	AC token	
PTR	COORDINATE token	
AC_PRED_DIR	ACPRED_DIR token	
QP	QUANT token	
PREV_QP	QUANT token	
Output		
Name	**Token**	
QF_AC	AC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.texture		

6.3.9 Algo_IDCT2D_ISOIEC_23002_1

FU Name	Algo_IDCT2D_ISOIEC_23002_1
Description	This module computes the 8×8 Inverse Discrete Cosine Transform (IDCT) defined as $$f(x,y)=\frac{2}{N}\sum_{u=0}^{N-1}\sum_{v=0}^{N-1}C(u)C(v)F(u,v)\cos\frac{(2x+1)u\pi}{2N}\cos\frac{(2y+1)v\pi}{2N}$$ with u, v, x, y = 0, 1, 2, …, N-1 where x, y are spatial coordinates in the sample domain u, v are coordinates in the transform domain $$C(u),C(v)=\begin{cases}\frac{1}{\sqrt{2}} & \text{for } u,v=0\\ 1 & \text{otherwise}\end{cases}$$ It inputs a list of 64 coefficients and outputs a list of 64 decoded coefficients.
Profiles@levels supported	MPEG-4 SP
Input	
Name	**Token**
IN	BLOCK token
SIGNED	SIGN token

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Output		
Name	**Token**	
OUT	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.texture		

6.3.10 Mgnt_DCSplit

FU Name	Mgnt_DCSplit	
Description	This module separates the DC coefficient from the AC coefficients. It takes as an input a list of 64 tokens and outputs on the DC port the DC coefficient (the first one) and the AC coefficient (the other 63) on the AC port.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
IN	BLOCK token	
Output		
Name	**Token**	
AC	AC token	
DC	DC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.texture		

6.4 Motion compensation

6.4.1 Mgnt_FB_w_Addess_8x8

FU Name	Mgnt_FB_Adress_8x8
Description	This module generates addresses for the frame buffer block. Write addresses (WA) are used to save the current pixels for retrieval and read addresses (RA) are used to retrieve interpolation pixel values. This module is a frame buffer. It saves data WD at address WA. It outputs the data RD located at address RA.
Profiles@levels supported	MPEG-4 SP
Input	
Name	**Token**
HEIGHT	HEIGHT token
MOT	MOTION token
MV	MV token
ROUND	ROUND token
VOPMODE	BTYPE token
WIDTH	WIDTH token
WD	MB token
Output	
Name	**Token**

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RA	MEM_ADDRESS token	
RD	MB token	
HALFPEL	DISPLACEMENT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.texture.motion		

6.4.2 Mgnt_FB_w_Addess_16x16

FU Name	Mgnt_FB_w_Address_16x16	
Description	This module generates addresses for the frame buffer block. Write addresses (WA) are used to save the current pixels for retrieval and read addresses (RA) are used to retrieve interpolation pixel values. This module is a frame buffer. It saves data WD at address WA. It outputs the data RD located at address RA.	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
HEIGHT	HEIGHT token	
MOT	MOTION token	
MV	MV token	
ROUND	ROUND token	
BTYPE	BTYPE token	
WIDTH	WIDTH token	
WD	MB token	
Output		
Name	**Token**	
RA	MEM_ADDRESS token	
RD	MB token	
HALFPEL	DISPLACEMENT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.motion		

6.4.3 Algo_PictureReconstruction_Saturation

FU Name	Algo_PictureReconstruction_Saturation
Description	This module adds texture pixels (TEX) and MC prediction pixels (MOT) in order to output the decoded pixels. For each ACCODED and WIDTH token inputted and according to the type of encoding of the block under consideration, the FU consumes either: — one MB token from the MOT input if the block is only a “motion” block; — one MB token from the TEX input if the block is only “texture” block; — one MB token from TEX input and one MB token from MOT input otherwise.
Profiles@levels supported	MPEG-4 SP
Input	
Name	**Token**
MOT	MB token

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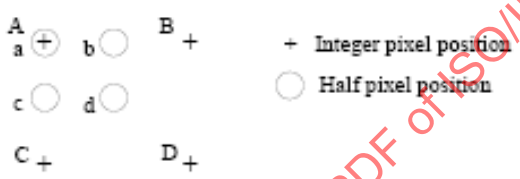
TEX	MB token	
ACCODED	ACCODED token	
BTYPE	BTYPE token	
Output		
Name	**Token**	
VID	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.motion		

6.4.4 Algo_Interp_HalfpelBilinearRoundingControl

FU Name	Algo_Interp_HalfpelBilinearRoundingControl	
Description	This module interpolates the pixels in case of a displacement between two frames of half a pixel. This is done according to the following scheme:  a = A, b = (A + B + 1 - rounding_control) / 2 c = (A + C + 1 - rounding_control) / 2, d = (A + B + C + D + 2 - rounding_control) / 4	
Profiles@levels supported	MPEG-4 SP	
Input		
Name	**Token**	
RD	MB token	
halfpel	DISPLACEMENT token	
Output		
Name	**Token**	
MOT	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part2.sp.motion		

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7 FUs for MPEG-4 AVC Constrained Baseline Profile

7.1 General

FUs for building MPEG-4 AVC (ISO/IEC 14496-10) Constrained Baseline Profile decoder are described in this clause.

7.2 Syntax parsing

7.2.1 Algo_NALU

FU Name	Algo_NALU	
Description	This module removes emulation_prevention_three_byte (0x03) and send to its output RBSP bytes and the number of rbsp bytes between 2 NAL units.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
bits8	BIT token	
Output		
Name	**Token**	
bits_rbsp8	RBSP token	
nb_rbsp_byte	NAL_SIZE token	
Parameter		
Name	**Description**	**Range**

7.2.2 Algo_SynP

FU Name	Algo_SynP
Description	This module analyses a sequence of tokens and realizes Parsing for MPEG-4 AVC syntax.
Profiles@levels supported	MPEG-4 AVC Constrained BP
Input	
Name	**Token**
BYTE	BIT token
Output	
Name	**Token**
REF_REORDERING	REF_ORDER token uint (size=31)
NB_REF_FRAME_l0	BIT token uint (size=5)
MMCO	MMCO token uint(size=31)
NUM_FREF_FRAME	NUM_REF_FRAME token uint(size=31)
FRAME_NUM	FRAME_NUM token uint(size=31)
REF_TYPE_l0	BIT token
MAX_FRAME_NUM	BIT token uint(size=31)
SLICE_DBF_PARAM	BIT token uint(size=6)
CONSTRAINED_IFLAG	BIT token
DBP_MAX_SZ	BIT token uint(size=6)
PIC_SIZE_IN_MB	SIZE token
POC	POC token
MB_LOCATION	MB_ID token
MB_TYPE	MB_TYPE token
CBP_BLK	CBP_BLK token
I_PCM	MB token
SUB_MB_TYPE	SUB_MB_TYPE token

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INTRA_PRED_MODE	PRED_MODE_INTRA token
INTRA_PRED_MODE_C	PRED_MODE_INTRA token
RUN	RUN token
VALUE	VALUE token
LAST	LAST token
QP	QUANT token
QP_Cb	QUANT token
QP_Cr	QUANT token
MB_PRED_REF_IDX_l0	REF_ID token
MB_PRED_MVD_l0	MVD token
SUB_MB_PRED_REF_IDX_l0	REF_ID token
MB_PRED_MVD_l0	MVD token
WIDTH	WIDTH token
HEIGHT	HEIGHT token

Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.parser		

7.2.3 Algo_BlockExpand

FU Name	Algo_BlockExpand
Description	This module decodes the DCT coefficients as elements of syntax in a MPEG-4 AVC Constrainted BP conformant bitstream.
Profiles@levels supported	MPEG-4 AVC Constrained BP
Input	
Name	**Token**
LAST	LAST token
RUN	RUN token
VALUE	VALUE token
MB_TYPE	MB_TYPE token
Output	
Name	**Token**
BLOCK	BLOCK token
Parameter	
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.parser		

7.2.4 Algo_BlockSplit

FU Name	Algo_BlockSplit
Description	This module splits DCT coefficient from LUMA/CHROMA into the DC and AC CHROMA/LUMA coefficients.
Profiles@levels supported	MPEG-4 AVC Constrained BP
Input	
Name	**Token**
BLOCK	BLOCK token
MB_TYPE	MB_TYPE token

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Output		
Name	**Token**	
BLOCK_U_AC	AC token	
BLOCK_U_DC	DC token	
BLOCK_V_AC	AC token	
BLOCK_V_DC	DC token	
BLOCK_Y_AC	AC token	
BLOCK_Y_DC	DC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.parser		

7.2.5 Algo_IntraPred_Split

FU Name	Algo_IntraPred_Split	
Description	This module sends information token of the prediction type (Mb_Type for LUMA and Mb_TypeC for CHROMA) and mode (PredMode) used by the current macroblock according to MbIntraFlag and IntraPredMode Input.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
MB_TYPE	MB_TYPE token	
INTRA_PRED_MODE	PRED_MODE_INTRA token	
MB_LOCATION	MB_ID token	
CONSTRAINED_IFLAG	BIT token	
Output		
Name	**Token**	
PRED_MODE	PRED_MODE_INTRA token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.parser		

7.2.6 Algo_Parser_I_PCM

FU Name	Algo_Parser_I_PCM
Description	This module splits an I_PCM macroblocs into Y, U and V I_PCM blocks.
Profiles@levels supported	MPEG-4 AVC Constrained BP
Input	
Name	**Token**
I_PCM	MB token
Output	
Name	**Token**
I_PCM_Y	MB token
I_PCM_U	MB token
I_PCM_V	MB token

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Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.parser		

7.2.7 Algo_DemuxParserInfoForBlocks_Chroma

FU Name	Algo_DemuxParserInfoForBlocks_Chroma	
Description	This module sends information for all Chroma prediction modules (intra 8×8, inter).	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
COEF_ACR	MB token	
MB_LOCATION	MB_ID token	
MB_TYPE	MB_TYPE token	
CONSTRAINED_IFLAG	BIT token	
Output		
Name	**Token**	
COEF_ACR_INTRA	BLOCK token	
NEIGHBOUR_INTRA	COORDINATE token	
COEF_ACR_INTER	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.selectMacroblock		

7.2.8 Algo_DemuxParserInfoForBlocks_Luma

FU Name	Algo_DemuxParserInfoForBlocks_Luma	
Description	This module sends information for all Luma prediction modules (intra 4×4, intra 16×16, inter).	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
COEF_ACR	MB token	
MB_LOCATION	MB_ID token	
MB_TYPE	MB_TYPE token	
PRED_MODE	PRED_INTRA_MODE token	
CONSTRAINED_IFLAG	BIT token	
Output		
Name	**Token**	
COEF_ACR_INTRA4	BLOCK token	
NEIGHBOUR_INTRA4	COORDINATE token	
PRED_MODE4	PRED_INTRA_MODE token	
COEF_ACR_INTRA16	BLOCK token	
NEIGHBOUR_INTRA16	COORDINATE token	
PRED_MODE16	PRED_INTRA_MODE token	

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COEF_ACR_INTER	BLOCK token	
SELECT	SELECT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.selectMacroblock		

7.3 Texture decoding

7.3.1 Algo_IS_Zigzag_4x4

FU Name	Algo_IS_Zigzag_4x4	
Description	This module inverts the one-dimensional array of coefficients ordered in zigzag scan to 2D raster order. It inputs a list of 16 integer coefficients (one per 4×4 block) and outputs the ordered list of integer values.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
X	BLOCK token	
Output		
Name	**Token**	
Y	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.Residual		

7.3.2 Algo_DCR_Hadamard_LUMA_IHT1d

FU Name	Algo_DCR_Hadamard_LUMA_IHT1d	
Description	This module computes 1 dimensional 4×4 Inverse Hadamard Transform for DC luminance coefficients of an intra 16×16 prediction block as a part of 2 dimensional 4×4 Inverse Hadamard Transform.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
X	DC token	
Output		
Name	**Token**	
Y	DC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.Residual		

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7.3.3 Algo_Transpose4x4

FU Name	Algo_Transpose4x4	
Description	This module transposes 4×4 integer array.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
X	DC token	
Output		
Name	**Token**	
Y	DC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.Residual		

7.3.4 Algo_DCR_Hadamard_LUMA_Reordering

FU Name	Algo_DCR_Hadamard_LUMA_Reordering	

Description	This module reorders 4×4 DC luminance coefficients of an intra 16×16 prediction macroblock from raster scan order to the order of block number specified in MPEG-4 AVC specification.
	
	The order of block number in a MB
	`+---+---+---+---+`
	`| 0 | 1 | 4 | 5 |`
	`+---+---+---+---+`
	`| 2 | 3 | 6 | 7 |`
	`+---+---+---+---+`
	`| 8 | 9 |12 |13 |`
	`+---+---+---+---+`
	`|10 |11 |14 |15 |`
	`+---+---+---+---+`	

Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
X	DC token	
Output		
Name	**Token**	
Y	DC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.Residual		

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7.3.5 Algo_DCR_Hadamard_LUMA_Scaling

FU Name	Algo_DCR_Hadamard_LUMA_Scaling	
Description	This module computes inverse quantization of DC luminance coefficients for intra 16×16 prediction macroblock.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
I	DC token	
QP	QUANT token	
MB_TYPE	MB_TYPE token	
Output		
Name	**Token**	
O	DC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.Residual		

7.3.6 Algo_DCR_Hadamard_CHROMA

FU Name	Algo_DCR_Hadamard_CHROMA	
Description	This module computes 2 dimensional 2×2 Inverse Hadamard Transform and inverse quantization for DC chrominance coefficients of a macroblock.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
IN	DC token	
QP	QUANT token	
Output		
Name	**Token**	
OUT	DC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.Residual		

7.3.7 Algo_IT4x4_1d

FU Name	Algo_IT4x4_1d
Description	This module computes 1 dimensional 4×4 Inverse Integer Transform for 4×4 block coefficients according to MPEG-4 AVC specification as a part of 2 dimensional 4×4 Inverse Integer Transform.
Profiles@levels supported	MPEG-4 AVC Constrained BP
Input	
Name	**Token**
X	BLOCK token

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Output		
Name	**Token**	
Y	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.Residual		

7.3.8 Algo_IT4x4_Addshift

FU Name	Algo_IT4x4_Addshift	
Description	This module computes right shifting of input integer value after adding value of 32 as a part of 2 dimensional 4×4 Inverse Integer Transform specified in MPEG-4 AVC specification.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
X	BLOCK token	
Output		
Name	**Token**	
Y	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.Residual		

7.3.9 Algo_IntraPred_LUMA_16x16

FU Name	Algo_IntraPred_LUMA_16x16	
Description	This module computes intra 16×16 predicted block for a 16×16 luminance block according to MPEG-4 AVC intra 16×16 prediction.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
Y_LEFT	COORDINATE token	
Y_UP	COORDINATE token	
Y_UP_LEFT	COORDINATE token	
AVAIL	ACKNOWLEDGMENT token	
PRED_MODE	PRED_MODE_INTRA token	
Output		
Name	**Token**	
MPR	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.intraPred		

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7.3.10 Algo_IntraPred_LUMA_4x4

FU Name	Algo_IntraPred_LUMA_4x4	
Description	This module computes intra 4×4 predicted block for a 4×4 luminance block according to MPEG-4 AVC intra 4×4 prediction.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
Y_LEFT	COORDINATE token	
Y_UP	COORDINATE token	
Y_UP_LEFT	COORDINATE token	
AVAIL	ACKNOWLEDGMENT token	
PRED_MODE	PRED_MODE_INTRA token	
Output		
Name	**Token**	
MPR	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.intraPred		

7.3.11 Algo_Merge_4x4_to_16x16

FU Name	Algo_Merge_4x4_to_16x16	
Description	This module merge 4×4 blocks send in rasterscan order into a 16×16 macroblocks.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
X	MB token	
Output		
Name	**Token**	
Y	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.Residual		

7.3.12 Algo_IQ_QSAndSLAndIDCTScaler_4x4

FU Name	Algo_IQ_QSAndSLAndIDCTScaler_4x4
Description	This module computes inverse quantization of 16 luminance 4×4 blocks and 4 chrominance 4×4 blocks for Cb and Cr components within a macroblock.
Profiles@levels supported	MPEG-4 AVC Constrained BP
Input	
Name	**Token**
IN	BLOCK token
QP	QUANT token

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IS_DC	BIT token	
Output		
Name	**Token**	
OUT	BLOCK token	
Parameter		
Name	**Description**	**Range**
NB4x4	Number of block 4×4 in a block	[4; 16]
Package		
package org.sc29.wg11.mpeg4.part10.cbp.Residual		

7.3.13 Mgnt_IQ_INTRA16x16

FU Name	Mgnt_IQ_INTRA16x16	
Description	This module combines DC coefficients, if available, with AC coefficients within a 16×16 block.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
COEF_DC	BLOCK token	
MB_TYPE	MB_TYPE token	
COEF_AC	BLOCK token	
Output		
Name	**Token**	
IS_DC	BIT token	
O	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.Residual		

7.3.14 Algo_IntraPred_4x4_to_8x8

FU Name	Algo_IntraPred_4x4_to_8x8	
Description	This module merge 4×4 blocks send in rasterscan order into a 8×8 macroblocks.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
X	MB token	
Output		
Name	**Token**	
Y	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.intraPred		

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7.3.15 Algo_IntraPred_CHROMA

FU Name	Algo_IntraPred_CHROMA	
Description	This module computes an intra chroma predicted block for a chrominance block according to MPEG-4 AVC intra chroma prediction.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
C_LEFT	COORDINATE token	
C_UP	COORDINATE token	
C_UP_LEFT	COORDINATE token	
AVAIL	ACKNOWLEDGMENT token	
PredMode	PRED_MODE_INTRA token	
Output		
Name	**Token**	
MPR	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.intraPred		

7.3.16 Mgnt_Intra16x16

FU Name	Mgnt_Intra_16x16	
Description	This module activates and sends the value of pixels needed for a full macrobloc intra prediction to output Y_LEFT, Y_UP, Y_UP_LEFT and the available edge for intra prediction to ouput. Values of needed pixels are received from EDGE input.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
EDGE	MB token	
NEIGHBOUR	BIT token	
Output		
Name	**Token**	
AVAIL	BIT token	
Y_LEFT	COORDINATE token	
Y_UP	COORDINATE token	
Y_UP_LEFT	COORDINATE token	
Parameter		
Name	**Description**	**Range**
MB_WIDTH	Size in pixel of macroblocks	[8;16]
Package		
package org.sc29.wg11.mpeg4.part10.cbp.intraPred		

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7.3.17 Mgnt_Intra4x4

FU Name	Mgnt_Intra_4x4	
Description	This module activates and sends the value of pixels needed for a 4×4 macrobloc intra prediction to output Y_LEFT4, Y_UP4, Y_UP_LEFT4, the available edge for intra prediction to ouput AVAIL and the prediction mode to ouput PRED_MODE4. Values of needed pixels are received from EDGE for neighbouring 16×16 pixels and MB_4x4 input for neighbouring 4×4 pixels.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
NEIGHBOUR	BIT token	
EDGE	MB token	
MB_4X4	MB token	
Output		
Name	**Token**	
AVAIL	BIT token	
Y_LEFT4	COORDINATE token	
Y_UP4	COORDINATE token	
Y_UP_LEFT4	COORDINATE token	
PRED_MODE4	PRED_MODE_INTRA token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.intraPred		

7.3.18 Mgnt_IQ_Chroma

FU Name	Mgnt_IQ_Chroma	
Description	This module adds the DC coefficient to the AC coefficients.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
COEF_DC	BLOCK token	
COEF_AC	BLOCK token	
Output		
Name	**Token**	
O	BLOCK token	
IS_DC	BIT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.intraPred		

7.3.19 Mgnt_Buffer_Neighbour_FullMb

FU Name	Mgnt_Buffer_Neighbour_FullMb
Description	This module stores bottom and right egde from macrobloc receive in input MB_IN and

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	send to EDGE according to CurrMbAddr and Mb_Type when full macroblock intra-prediction is needed.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
MB_LOCATION	MB_ID token	
MB_IN	MB token	
MB_TYPE	MB_TYPE token	
Output		
Name	**Token**	
EDGE	MB token	
Parameter		
Name	**Description**	**Range**
IsChroma	If this FU operates on chrominance	boolean
MB_WIDTH	Size in pixel of macroblocks	[8;16]
Package		
package org.sc29.wg11.mpeg4.part10.cbp.intraPred		

7.3.20 Mgnt_Buffer_Neighbour_YxY

FU Name	Mgnt_Buffer_Neighbour_YxY	
Description	This module stores bottom and right egde from macrobloc receive in input MB_IN and send to EDGE according to CurrMbAddr and Mb_Type when 4×4 macroblock intra-prediction is needed.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
MB_LOCATION	MB_ID token	
MB_IN	MB token	
MB_TYPE	MB_TYPE token	
Output		
Name	**Token**	
EDGE	MB token	
Parameter		
Name	**Description**	**Range**
IsIntra4x4	If this FU is used for intra 4x4 blocks	boolean
Package		
package org.sc29.wg11.mpeg4.part10.cbp.intraPred		

7.3.21 Algo_Merge_4x4_to_16x16_norasterscan

FU Name	Algo_Merge_4x4_to_16x16_norasterscan
Description	This module merges 4×4 blocks send in norasterscan order into a 16×16 macroblocks.
Profiles@levels supported	MPEG-4 AVC Constrained BP
Input	
Name	**Token**
X	MB token
Output	
Name	**Token**

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Y	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.intraPred		

7.3.22 Algo_Split_16x16_to_4x4_norasterscan

FU Name	Algo_Split_16x16_to_4x4_norasterscan	
Description	This module splits 16×16 blocks send in non rasterscan order into 4×4 blocks.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
X	MB token	
Output		
Name	**Token**	
Y	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.intraPred		

7.4 Motion compensation

7.4.1 Algo_Interp_EighthPelBilinear

FU Name	Algo_Interp_Bilinear	
Description	This FU performs fractional chroma sample interpolation with bilinear filter. Interpolating a sample in a fractional position requires at most 2×2 integer samples around the interpolated location.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
RD	MEM_DATA token	
PARTSZ	PART_SIZE token	
MV	MV token	
Output		
Name	**Token**	
INTERP	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.interPred		

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7.4.2 Algo_Interp_SeparableSixTapQuarterPel

FU Name	Algo_Interp_SeparableSixTapQuarterPel	
Description	This FU performs fractional luma sample interpolation with separable 6-tap FIR linear phase filter. Interpolating a sample in a fractional position requires at most 6x6 integer samples around the interpolated location:	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
RD	MEM_DATA token	
PARTSZ	PART_SIZE token	
MV	MV token	
Output		
Name	**Token**	
INTERP	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.interPred		

7.4.3 Algo_Interp_Reord

FU Name	Algo_Interp_Reord	
Description	This module reconstructs an inter prediction macroblock from the partition of inter prediction.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
INTERP	MB token	
MB_TYPE	MB_TYPE token	
SUB_MB_TYPE	SUB_MB_TYPE token	
Output		
Name	**Token**	
MBPRED	MB token	
Parameter		
Name	**Description**	**Range**
SzSidePerPart	If CHROMA then 2 else /*LUMA*/ 4 end	[2; 4]
Package		
package org.sc29.wg11.mpeg4.part10.cbp.interPred		

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7.4.4 Algo_MvLXReconstr

FU Name	Algo_MvLXReconstr	
Description	This FU finds a motion vector predictor by using reference index and MV of neighbouring blocks (left, top, top right). This process is adaptively switched according to the partition size of the current block and availability of the neighbouring blocks. It also adds the residual motion vector.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
MB_LOCATION	MB_ID token	
MB_TYPE	MB_TYPE token	
SUB_MB_TYPE	SUB_MB_TYPE token	
MB_PRED_REF_IDX	REF_ID token	
SUB_MB_PRED_REF_IDX	REF_ID token	
MB_PRED_MVD	MVD token	
SUB_MB_PRED_MVD	MVD token	
Output		
Name	**Token**	
MV_OUT	MV token	
LOCATION	MB_ID token	
IS_NEW_MB_PIC	BIT token	
IS_NEW_MB_SLICE	BIT token	
Parameter		
Name	**Description**	**Range**
IsPredL0	Only PredL0 if true else PredL1 or PredL0	boolean
Package		
package org.sc29.wg11.mpeg4.part10.cbp.interPred		

7.4.5 Mgnt_DPB

FU Name	Mgnt_DPB	
Description	This module stores decoded pictures input from WD port according to the macroblock address (CurrMbAddr), and sends parts of a selected stored picture output through RD port for inter prediction, according to the prediction type (Mb_Type), current position of the macroblock (CurrMbAddr), a motion vecteur (MV) and an id of frame (RefIdx). This module also reorganizes and erases the picture stored into its iternal memory according to RefList input.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
PIC_SIZE_IN_MB	SIZE token	
MB_TYPE	MB_TYPE token	
FRAME_NUM	FRAME_NUM token	
FRAME_TO_READ	FRAME_TO_READ token	
DEL_LIST	DEL_LIST token	
ENABLE_READ	BIT token	
WD	MB token	
RA	RA token	
Output		
Name	**Token**	
RD	MEM_DATA token	
Parameter		

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Name	Description	Range
MB_WIDTH	Width and Height in pixel of a macroblock	[8;16]
Package		
package org.sc29.wg11.mpeg4.part10.cbp.interPred		

7.4.6 Algo_MMCO

FU Name	Algo_MMCO	
Description	This modules marks the index of frames to store as long terme reference, short terme reference, to delete or reorganize in memory. RefReordering indicates whether or not a reordering of the frame stored in memory is necessary.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
MMCO	MMCO token	
FRAME_NUM	FRAM_NUM token	
MAX_FRAME_NUM	MAX_FRAME_NUM token	
NUM_REF_FRAME	NUM_REF_FRAME token	
POC	POC token	
MB_TYPE	MB_TYPE token	
Output		
Name	**Token**	
DEL_LIST	DEL_LIST token	
LT_LIST	LT_LIST token	
ST_LIST	ST_LIST token	
ST_LIST_SZ	ST_LIST_SZ token	
EMPTY_DBP	BIT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.interPred		

7.4.7 AlgoRefList

FU Name	Algo_RefList
Description	This FU manages short term and long term reference lists of AVC. This FU is managed by Algo_MMCO.
Profiles@levels supported	MPEG-4 AVC Constrained BP
Input	
Name	**Token**
LT_LIST	LT_LIST token
ST_LIST	ST_LIST token
ST_LIST_SZ	ST_LIST_SZ token
NB_REF_FRAME	NB_REF_FRAME token
POC	POC token
REF_TYPE_LIST	REF_TYPE_LIST token
EMPTY_DPB	BIT token
FRAME_NUM	FRAM_NUM token

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MAX_FRAME_NUM	MAX_FRAME_NUM token	
Output		
Name	**Token**	
REF_LIST	REF_LIST token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.interPred		

7.4.8 Mgnt_InterPred

FU Name	Mgnt_InterPred	
Description	This FU issues an address and a reference frame ID to the luma frame buffer to fetch necessary data for the luma fractional sample interpolation. It also notifies the luma fractional sample interpolation FU which mode is selected via Frac.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
MV	MV token	
LOCATION	MB_ID token	
PARTSZ	PART_SIZE token	
Output		
Name	**Token**	
ADDR_L	MEM_ADDRESS token	
ADDR_C	MEM_ADDRESS token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.interPred		

7.4.9 Algo_RefIdxtoFrameNum

FU Name	Algo_RefIdxToFrameNum	
Description	This module computes the frame to read for each MV.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
REF_LIST	REF_LIST token	
REF_IXD	REF_ID token	
IS_NEW_MB	BIT token	
Output		
Name	**Token**	
READ_FRAME	FRAME_TO_READ token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.interPred		

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7.5 Filtering

7.5.1 Mgnt_DBF_AdaptiveFilter

FU Name	Mgnt_DBF_AdaptiveFilter	
Description	This FU implements deblocking filter without supporting MBAFF	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
CBP_BLK	CBP_BLK token	
MB_LOCATION	MEM_WIDTH token	
SLICE_DBF_PARAM	SLICE_DBF_PARAM token	
MB_TYPE	MB_TYPE token	
MV	MV token	
QP_Y	QUANT token	
QP_Cb	QUANT token	
QP_Cr	QUANT token	
READ_FRAME	REF_ID token	
Output		
Name	**Token**	
BS	BS token	
MB_DBF_PARAM_Y	MB_DBF_PARAM token	
MB_DBF_PARAM_U	MB_DBF_PARAM token	
MB_DBF_PARAM_V	MB_DBF_PARAM token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.deblockingFilter		

7.5.2 Algo_DBF_AdaptiveFilter

FU Name	Algo_DBF_AdaptiveFilter	
Description	This FU implements deblocking filter.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
MB_TYPE	MB_TYPE token	
BS	BS token	
MB_LOCATION	MB_ID token	
PIC_SIZE_IN_MB	MEM_HEIGHT token	
MB_DBF_PARAM	MB_DBF_PARAM token	
CBP_BLK	CBP_BLK token	
MB_IN	MB token	
Output		
Name	**Token**	
MB_OUT	MB token	
Parameter		
Name	**Description**	**Range**
MbWidth	Size in pixel of a macroblock	[8;16]
ChromaEdgeFlag	LUMA = false, CHROMA=true	bool

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Package
package org.sc29.wg11.mpeg4.part10.cbp.deblockingFilter

7.5.3 Algo_MvComponentReorder

FU Name	Algo_MvComponentReorder
Description	This FU reoganizes Motion vector for the deblocking filter
Profiles@levels supported	MPEG-4 AVC Constrained BP
Input	
Name	**Token**
MB_TYPE	MB_TYPE token
MV	MV token
SUB_MB_TYPE	SUB_MB_TYPE token
READ_FRAME	REF_ID token
Output	

7.6 Renderer

7.6.1 Mgnt_POC

FU Name	Mgnt_POC	
Description	This module select the order of the frame to display according to POC input.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
MB_TYPE	MB_TYPE token	
POC	POC token	
DBP_MAX_SZ	DBP_MAX_SZ token	
EMPTY_DPB	BIT token	
Output		
Name	**Token**	
POC_DISPLAY	POC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.display		

7.6.2 Mgnt_BufferRender

FU Name	Mgnt_BufferRender
Description	Based on the POC, this module will buffer and display the picture in the right order.
Profiles@levels supported	MPEG-4 AVC Constrained BP
Input	
Name	**Token**
MB_TYPE	MB_TYPE token
POC	POC token
POC_DISPLAY	POC token
WD	MB token

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Output		
Name	**Token**	
O	MB token	
Parameter		
Name	**Description**	**Range**
MbWidth	Size in pixel of a macroblock	[8;16]
Package		
package org.sc29.wg11.mpeg4.part10.cbp.display		

7.6.3 Mgnt_Merger420_AVC

FU Name	Mgnt_Merger420_AVC	
Description	This module merges data from YUV to compose a MB 16×16.	
Profiles@levels supported	MPEG-4 AVC Constrained BP	
Input		
Name	**Token**	
Y	BLOCK token	
U	BLOCK token	
V	BLOCK token	
Select	SELECT token	
Output		
Name	**Token**	
YUV	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.cbp.display		

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8 FUs for MPEG-4 AVC Progressive High Profile

8.1 General

8.1.1 Overview

FUs for building MPEG-4 AVC High Profile decoder are described in this clause.

8.1.2 Algo_SynP

FU Name	Algo_SynP
Description	This module analyses a sequence of tokens and realizes Parsing for MPEG-4 AVC syntax.
Profiles@levels supported	MPEG-4 AVC Progressive High Profile
Input	
Name	**Token**
BYTE	BIT token
Output	
Name	**Token**
MMCO	MMCO token uint(size=31)
NUM_FREF_FRAME	NUM_REF_FRAME token uint(size=31)
FRAME_NUM	FRAME_NUM token uint(size=31)

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NB_REF_FRAME_l0	BIT token uint(size=5)
REF_TYPE_l0	BIT token
REF_REORDERING_l0	REF_ORDER token uint(size=31)
NB_REF_FRAME_l1	BIT token uint(size=5)
REF_TYPE_l1	BIT token
REF_REORDERING_l1	REF_ORDER token uint(size=31)
MAX_FRAME_NUM	BIT token uint(size=31)
SLICE_DBF_PARAM	BIT token uint(size=6)
CONSTRAINED_IFLAG	BIT token
DBP_MAX_SZ	BIT token uint(size=6)
PIC_SIZE_IN_MB	SIZE token
POC	POC token
SCALING_LIST_Y	SCALING_LIST token
SCALING_LIST_U	SCALING_LIST token
SCALING_LIST_V	SCALING_LIST token
MB_LOCATION	MB_ID token
MB_TYPE	MB_TYPE token
CBP_BLK	CBP_BLK token
I_PCM	MB token
SUB_MB_TYPE	SUB_MB_TYPE token
INTRA_PRED_MODE	PRED_MODE_INTRA token
INTRA_PRED_MODE_C	PRED_MODE_INTRA token
RUN	RUN token
VALUE	VALUE token
LAST	LAST token
QP	QUANT token
QP_Cb	QUANT token
QP_Cr	QUANT token
MB_PRED_REF_IDX_l0	REF_ID token
MB_PRED_MVD_l0	MVD token
SUB_MB_PRED_REF_IDX_l0	REF_ID token
MB_PRED_MVD_l0	MVD token
MB_PRED_REF_IDX_l1	REF_ID token
MB_PRED_MVD_l1	MVD token
SUB_MB_PRED_REF_IDX_l1	REF_ID token
MB_PRED_MVD_l1	MVD token
DIRECT_SPATIAL_MV_PRED_FLAG	BIT token
TRANSFORM_SIZE_8x8_FLAG	BIT token
DIRECT_8X8_INTERFERENCE_FLAG	BIT token
WEIGHTED_PRED_IDC	BIT token uint(size=2)
WP_PARAM	BIT token uint(size=9)
WIDTH	WIDTH token
HEIGHT	HEIGHT token

Parameter

Name	Description	Range

Package

package org.sc29.wg11.mpeg4.part10.php.parser

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8.1.3 Algo_BlockExpand

FU Name	Algo_BlockExpand	
Description	This module decodes the DCT coefficients as elements of syntax in a MPEG-4 AVC. Progressive High Profile conforming bitstream (conforming with CALVC and CABAC).	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
LAST	LAST token	
RUN	RUN token	
VALUE	VALUE token	
MB_TYPE	MB_TYPE token	
Output		
Name	**Token**	
BLOCK	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.parser		

8.1.4 Algo_DemuxParserInfoForBlocks_Luma

FU Name	Algo_DemuxParserInfoForBlocks_Luma	
Description	This module adds information to package org.sc29.wg11.mpeg4.part10.php.selectMacroblock. Algo_DemuxParserInfoForBlocks_Luma by adding support for intra 8×8 decoding blocks.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
COEF_ACR	MB token	
MB_LOCATION	MB_ID token	
MB_TYPE	MB_TYPE token	
PRED_MODE	PRED_INTRA_MODE token	
CONSTRAINED_IFLAG	BIT token	
Output		
Name	**Token**	
COEF_ACR_INTRA4	BLOCK token	
NEIGHBOUR_INTRA4	COORDINATE token	
PRED_MODE4	PRED_INTRA_MODE token	
COEF_ACR_INTRA16	BLOCK token	
NEIGHBOUR_INTRA16	COORDINATE token	
PRED_MODE16	PRED_INTRA_MODE token	
COEF_ACR_INTRA8	BLOCK token	
NEIGHBOUR_INTRA8	COORDINATE token	
PRED_MODE8	PRED_INTRA_MODE token	
COEF_ACR_INTER	BLOCK token	
SELECT	SELECT token	
Parameter		
Name	**Description**	**Range**

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Package		
package org.sc29.wg11.mpeg4.part10.php.selectMacroblock		

8.2 Texture decoding

8.2.1 Algo_IS_Zigzag_8x8

FU Name	Algo_IS_Zigzag_8x8	
Description	This module computes inverse zigzag of an 8×8 block.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
X	BLOCK token	
Output		
Name	**Token**	
Y	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.Residual		

8.2.2 Algo_IQ_QSAndSLAndIDCTScaler_8x8

FU Name	Algo_IQ_QSAndSLAndIDCTScaler_8x8	
Description	This module computes inverse quantization of 8×8 blocks with scaling list (weight scale) following by scaling of the 8×8 Inverse Integer Cosine Transform.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
IN	BLOCK token	
QP	QUANT token	
MB_TYPE	MB_TYPE token	
Output		
Name	**Token**	
OUT	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.Residual		

8.2.3 Algo_IIT_8x8

FU Name	Algo_IIT_8x8
Description	This module computes 2D IIT (Inverse Integer Transform) of 8×8 blocks. 2D IIT is achieved by row column decomposition of the coefficients.

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Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
X	BLOCK token	
Output		
Name	**Token**	
Y	BLOCK token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.Residual		

8.2.4 Algo_IntraPred_LUMA_8x8

FU Name	Algo_IntraPred_LUMA_8x8	
Description	This module computes intra 8×8 predicted block for a 8×8 luma block according to MPEG-4 AVC intra 8×8 prediction.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
Y_LEFT	COORDINATE token	
Y_UP	COORDINATE token	
Y_UP_LEFT	COORDINATE token	
Y_UP_RIGHT	COORDINATE token	
AVAIL	ACKNOWLEDGMENT token	
PRED_MODE	PRED_MODE_INTRA token	
Output		
Name	**Token**	
MPR	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.intraPred		

8.2.5 Mgnt_Intra_8x8

FU Name	Mgnt_Intra_8x8	
Description	This module activates and sends samples needed for a 8×8 Macroblock intra prediction to output Y_LEFT8, Y_UP8, Y_UP_LEFT8, Y_UP_RIGHTT8, the available edge for intra prediction to ouput AVAIL and the prediction mode to ouput PRED_MODE4. Values of needed samples are received from EDGE for neighbouring 16×16 block samples and MB_8x8 input for neighbouring 8×8 block samples.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
NEIGHBOUR	BIT token	
EDGE	MB token	

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MB_8X8	MB token	
Output		
Name	**Token**	
AVAIL	BIT token	
Y_LEFT8	COORDINATE token	
Y_UP8	COORDINATE token	
Y_UP_LEFT8	COORDINATE token	
Y_UP_RIGHT8	COORDINATE token	
PRED_MODE8	PRED_MODE_INTRA token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.intraPred		

8.2.6 Algo_Merge_8x8_to_16x16

FU Name	Algo_Merge_8x8_to_16x16	
Description	This module merges 8×8 blocks send in raster scan order into a 16×16 block.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
X	MB token	
Output		
Name	**Token**	
Y	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.Residual		

8.2.7 Algo_DCR_Hadamard_CHROMA

FU Name	Algo_DCR_Hadamard_CHROMA	
Description	This module overrides FU from Constrained Baseline Profile to support scaling list in Progressive High Profile.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
IN	DC token	
QP	QUANT token	
MB_TYPE	MB_TYPE token	
SCALING_LIST	SCALING_LIST token	
Output		
Name	**Token**	
OUT	DC token	
Parameter		
Name	**Description**	**Range**

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Package
package org.sc29.wg11.mpeg4.part10.php.Residual

8.2.8 Algo_DCR_Hadamard_LUMA_Scaling

FU Name	Algo_DCR_Hadamard_LUMA_Scaling	
Description	This module adds the support of scaling list to org.sc29.wg11.mpeg4.part10.php.Residual.Algo_DCR_Hadamard_LUMA_Scaling.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
I	DC token	
QP	QUANT token	
MB_TYPE	MB_TYPE token	
SCALING_LIST	SCALING_LIST token	
Output		
Name	**Token**	
O	DC token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.Residual		

8.2.9 Algo_IQ_QSAndSLAndIDCTScaler_4x4

FU Name	Algo_IQ_QSAndSLAndIDCTScaler_4x4	
Description	This module adds the support of non default scaling list to org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IQ_QSAndSLAndIDCTScaler_4x4.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
IN	BLOCK token	
QP	QUANT token	
IS_DC	BIT token	
MB_TYPE	MB_TYPE token	
SCALING_LIST	SCALING_LIST token	
Output		
Name	**Token**	
OUT	BLOCK token	
Parameter		
Name	**Description**	**Range**
NB4x4	Number of block 4×4 in a block	[4; 16]
Package		
package org.sc29.wg11.mpeg4.part10.php.Residual		

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8.2.10 Algo_Merge_8x8_to_16x16_norasterscan

FU Name	Algo_Merge_8x8_to_16x16_norasterscan	
Description	This module merges 8×8 blocks sent in non raster scan order into a 16×16 block.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
X	MB token	
Output		
Name	**Token**	
Y	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.intraPred		

8.2.11 Algo_Split_16x16_to_8x8_norasterscan

FU Name	Algo_Split_16x16_to_8x8_norasterscan	
Description	This module splits a 16x16 block sent in non-raster scan order into 8×8 blocks.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
X	MB token	
Output		
Name	**Token**	
Y	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.intraPred		

8.2.12 Mgnt_I4x4_I8x8_demux

FU Name	Mgnt_I4x4_I8x8_demux
Description	This module splits the information to compute the residual of a 4×4 block or a 8×8 block.
Profiles@levels supported	MPEG-4 AVC Progressive High Profile
Input	
Name	**Token**
COEF_AC	MB token
MB_TYPE	MB_TYPE token
QP	QUANT token
SCALING_LIST	SCALING_LIST token
TRANSFORM_SIZE_8x8_FLAG	BIT token
Output	
Name	**Token**
COEF_AC_4x4	MB token
MB_TYPE_4x4	MB_TYPE token

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QP_4x4	QUANT token	
SCALING_LIST_4x4	SCALING_LIST token	
COEF_AC_8x8	MB token	
MB_TYPE_8x8	MB_TYPE token	
QP_8x8	QUANT token	
SCALING_LIST_8x8	SCALING_LIST token	
TRANSFORM_SIZE_8x8_FLAG_O	BIT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.intraPred		

8.2.13 Mgnt_I4x4_I8x8_mux

FU Name	Mgnt_I4x4_I8x8_mux	
Description	This module reoders the information with the residual coming from an 4×4 block or a 8×8 block.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
COEF_AC_4x4	MB token	
COEF_AC_8x8	MB token	
TRANSFORM_SIZE_8x8_FLAG	BIT token	
Output		
Name	**Token**	
COEF_AVC	MB token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.intraPred		

8.3 Motion compensation

8.3.1 Algo_GeneratePredWeight

FU Name	Algo_GeneratePredWeight
Description	This FU performs weighted sum of two block partitions if necessary.
Profiles@levels supported	MPEG-4 AVC Progressive High Profile
Input	
Name	**Token**
IS_NEW_MB_L0	BIT token
IS_NEW_MB_L1	BIT token
POC_LISTX	POC_LIST token
POC_IS_LT	BIT token
REF_IDX_L0	REF_ID token
REF_IDX_L1	REF_ID token
SELECT_LIST	BIT token
WP_PRED_IDC	BIT token uint(size=2)
WP_PARAM	BIT token uint(size=9)
Output	

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Name	Token	
WP_PARAM_Y	BIT token uint(size=9)	
WP_PARAM_U	BIT token uint(size=9)	
WP_PARAM_V	BIT token uint(size=9)	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.interPred		

8.3.2 Mgnt_SelectMvpLX

FU Name	Mgnt_SelectMvpLX	
Description	This FU computes MV for each list.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
MB_TYPE	MB_TYPE token	
SUB_MB_TYPE	SUB_MB_TYPE token	
MV_L0	MVD token	
LOCATION_L0	MB_ID token	
FRAME_L0	FRAME_TO_READ token	
MV_L1	MVD token	
FRAME_L1	FRAME_TO_READ token	
LOCATION_L1	MB_ID token	
DIRECT_PRED_L0	BIT token	
DIRECT_PRED_L1	BIT token	
REF_IDX_L0	REF_ID token	
REF_IDX_L1	REF_ID token	
Output		
Name	**Token**	
MV	MVD token	
READ_FRAME		
LOCATION		
SELECT_LIST		
REF_IDX	MVD token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.interPred		

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8.3.3 Algo_MvLXReconstr

FU Name	Algo_MvLXReconstr
Description	This FU finds a motion vector predictor by using reference index and MV of neighbouring blocks (left, top, top right). This process is adaptively switched according to the partition size of the current block and availability of the neighbouring blocks. It also adds the residual motion vector.
Profiles@levels supported	MPEG-4 AVC Progressvie High Profile
Input	
Name	**Token**
MB_LOCATION	MB_ID token
MB_TYPE	MB_TYPE token

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SUB_MB_TYPE	SUB_MB_TYPE token	
MB_PRED_REF_IDX	REF_ID token	
SUB_MB_PRED_REF_IDX	REF_ID token	
MB_PRED_MVD	MVD token	
SUB_MB_PRED_MVD	MVD token	
COL_ZERO_FLAG	BIT token	
TEMPORAL_PRED_INFO	BIT token int(size=32)	
DIRECT_SPATIAL_MV_FLAG	BIT token	
DIRECT_PRED_LX_I	BIT token	
Output		
Name	**Token**	
MV_OUT	MV token	
LOCATION	MB_ID token	
IS_NEW_MB_PIC	BIT token	
IS_NEW_MB_SLICE	BIT token	
DIRECT_PRED_LX_O	BIT token	
Parameter		
Name	**Description**	**Range**
IsPredL0	Only PredL0 if true else PredL1 or PredL0	boolean
Package		
package org.sc29.wg11.mpeg4.part10.php.interPred		

8.3.4 Algo_MvBuffer

FU Name	Algo_MvBuffer	
Description	This FU manages motion vectors for an entire frame when List1 is used.	
Profiles@levels supported	MPEG-4 AVC Progressvie High Profile	
Input		
Name	**Token**	
MB_LOCATION	MB_ID token	
MB_TYPE	MB_TYPE token	
SUB_MB_TYPE	SUB_MB_TYPE token	
REF_IDX	REF_ID token	
MV	MVD token	
DIRECT8x8_INFERENCE_FLAG	BIT token	
DIRECT_SPATIAL_MV_FLAG	BIT token	
EMPTY_DPB	BIT token	
FRAME_NUM	FRAME_NUM token	
POC	POC token	
DEL_LIST	DEF_LIST token	
LT	LT_LIST token	
REF_LIST0	REF_LIST token	
REF_LIST1	REF_LIST token	
Output		
Name	**Token**	
COL_ZERO_FLAG	BIT token	
TEMPORAL_PRED_INFO	BIT token int (size=32)	
Parameter		
Name	**Description**	**Range**
IsPredL0	Only PredL0 if true else PredL1 or PredL0	boolean
Package		
package org.sc29.wg11.mpeg4.part10.php.interPred		

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8.3.5 Mgnt_SelectMvpLX

FU Name	Mgnt_SelectRefIdx	
Description	This FU selects the frame to read depending on the list.	
Profiles@levels supported	MPEG-4 AVC Progressvie High Profile	
Input		
Name	**Token**	
SELECT_LIST	BIT token	
READ_FRAME_L0	READ_FRAME token	
READ_FRAME_L1	READ_FRAME token	
IS_NEW_MB_L0	BIT token	
IS_NEW_MB_L1	BIT token	
Output		
Name	**Token**	
READ_FRAME	READ_FRAME token	
READ_4MB_PRED	BIT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.interPred		

8.3.6 Algo_FrameNumToPocList

FU Name	Algo_FrameNumToPocList	
Description	This FU generates a list of POC for the weighted prediction FU.	
Profiles@levels supported	MPEG-4 AVC Progressvie High Profile	
Input		
Name	**Token**	
DEL_LIST	DEL_LIST token	
EMPTY_DPB	BIT token	
FRAME_NUM	FRAME_NUM token	
MB_TYPE	MB_TYPE token	
LT	LT_LIST token	
POC	POC token	
REF_LIST0	REF_LIST token	
REF_LIST1	REF_LIST token	
Output		
Name	**Token**	
POC_LISTX	POC token	
POC_IS_LT	BIT token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.interPred		

8.4 Filtering

8.4.1 Algo_DBF_AdaptiveFilter

FU Name	Algo_DBF_AdaptiveFilter
Description	This FU replaces deblocking filter from org.sc29.wg11.mpeg4.part10.cbp.deblockingFilter. Algo_DBF_AdaptiveFilter

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	in order to support deblocking of 8×8 blocks.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
MB_TYPE	MB_TYPE token	
BS	BS token	
MB_LOCATION	MB_ID token	
PIC_SIZE_IN_MB	MEM_HEIGHT token	
MB_DBF_PARAM	MB_DBF_PARAM token	
CBP_BLK	CBP_BLK token	
MB_IN	MB token	
TRANSFORM_SIZE_8x8_FLAG	BIT token	
Output		
Name	**Token**	
MB_OUT	MB token	
Parameter		
Name	**Description**	**Range**
MB_WIDTH	Size in samples of a Macroblock width	[8;16]
Package		
package org.sc29.wg11.mpeg4.part10.php.deblockingFilter		

8.4.2 Algo_MvComponentReorder

FU Name	Algo_MvComponentReorder	
Description	This FU reorganizes motion vectors for the deblocking filter.	
Profiles@levels supported	MPEG-4 AVC Progressive High Profile	
Input		
Name	**Token**	
MB_TYPE	MB_TYPE token	
SUB_MB_TYPE	SUB_MB_TYPE token	
MV	MV token	
SUB_MB_TYPE	SUB_MB_TYPE token	
READ_FRAME	REF_ID token	
SELECT_LIST	BIT token	
Output		
Name	**Token**	
MV	MV token	
READ_FRAME_DBF	REF_ID token	
PARTSZ	PART_SIZE token	
REF_IDX_TAB	REF_IDX token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part10.php.deblockingFilter		

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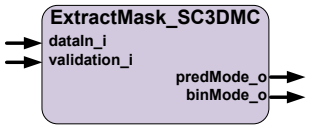
9 MPEG-4 Part 16 SC3DMC decoder specific FUs

9.1 General

The specific FUs for building MPEG-4 Part 16 (ISO/IEC 14496-16) SC3DMC decoder are described in this clause.

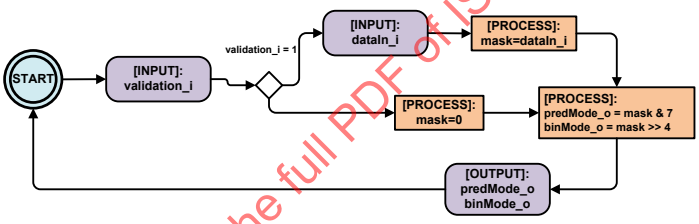
9.2 Algo_ExtractMask_SC3DMC

FU Name: Algo_ExtractMask_SC3DMC



Port Name	Direction (I/O)	Token RANGE
dataIn_i	I	UINT_8
validation_i	I	BOOLEAN
predMode_o	O	UINT_8
binMode_o	O	UINT_8

Algo_ExtractMask_SC3DMC Schematic:



Description

Algo_ExtractMask_SC3DMC Process:
START:
INPUT:
validation_i
IF validation_i = 1
INPUT:
  dataIn_i
  PROCESS:
mask = dataIn_i;
ELSE
  PROCESS:
mask = 0
PROCESS:
  predMode_o = mask & 7;
  binMode_o = mask >> 4;
OUTPUT:
  predMode_o
  binMode_o
GOTO START

NOTE:
SC3DMC mask description:

Bit position	7	6	5	4	3	2	1	0
	bit	bit	bit	bit	bit	bit	bit	bit
Flag	Binarization Mode				x	Prediction Mode		

ISO Standards using the FU: ISO/IEC 14496-16

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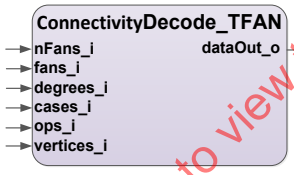
Profiles@levels supported	MPEG-4 Part 16 SC3DMC	
Input		
Name	**Token**	
dataIn_i	UINT_8	
validation_i	BOOLEAN	
Output		
Name	**Token**	
predMode_o	UINT_8	
binMode_o	UINT_8	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part16		

9.3 MPEG-4 SC3DMC TFAN Specific FUs

9.3.1 Algo_DecodeConnectivity_TFAN

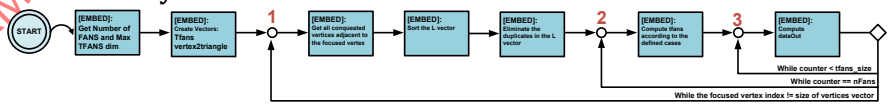
FU Name: Algo_DecodeConnectivity_TFAN

Description

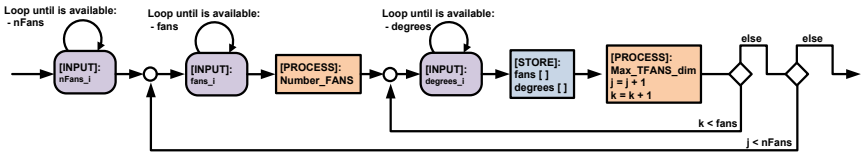


Port Name	Direction (I/O)	Token RANGE
nFans_i	I	UINT8, UINT16, UINT32, UINT64
fans_i	I	UINT8, UINT16, UINT32, UINT64
degrees_i	I	UINT8, UINT16, UINT32, UINT64
cases_i	I	UINT8, UINT16, UINT32, UINT64
ops_i	I	UINT8, UINT16, UINT32, UINT64
vertices_i	I	UINT8, UINT16, UINT32, UINT64
dataOut_o	O	UINT8, UINT16, UINT32, UINT64

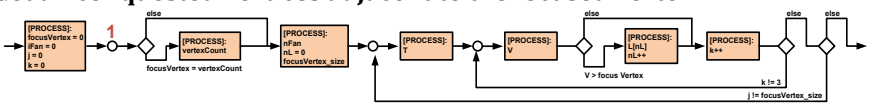
Decode Connectivity TFAN FSM:



Get Number of FANS and Max TFANS dim:



Get all conquested vertices adjacent to the focused vertex:



Sort the L vector: The implementation of any algorithm that is able to sort an array.

Eliminate the duplicates in the L vector: The implementation of any algorithm that is able

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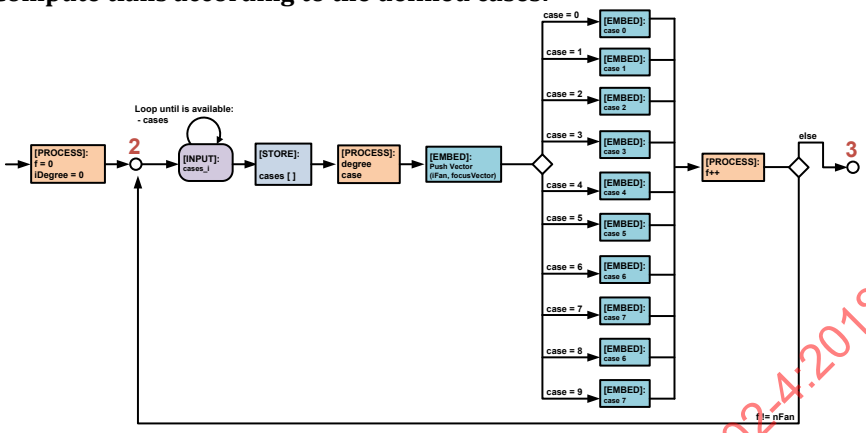
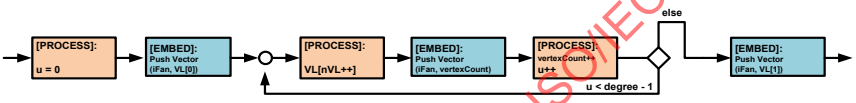
to eliminate the duplicates from a sorted array.

Compute tfans according to the defined cases:

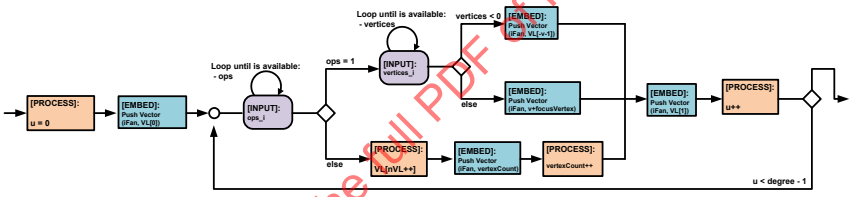


Cases:

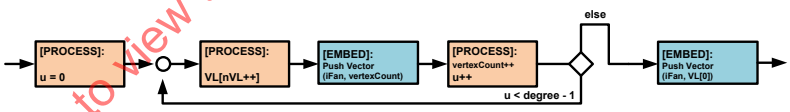
CASE = 0



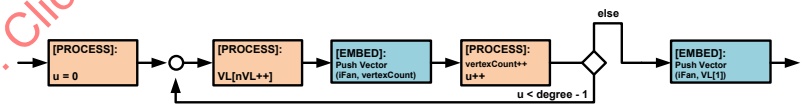
CASE = 1



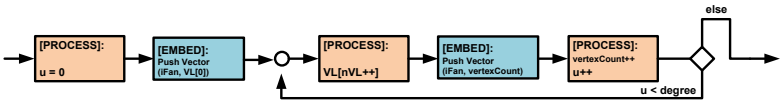
CASE = 2



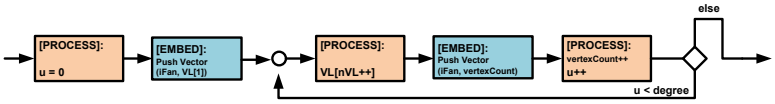
CASE = 3



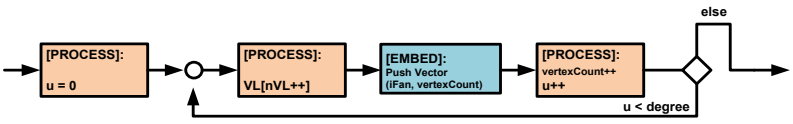
CASE = 4



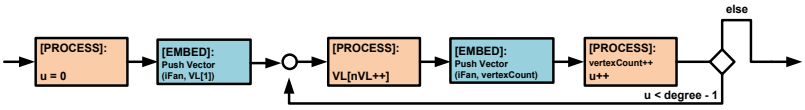
CASE = 5



CASE = 6



CASE = 7



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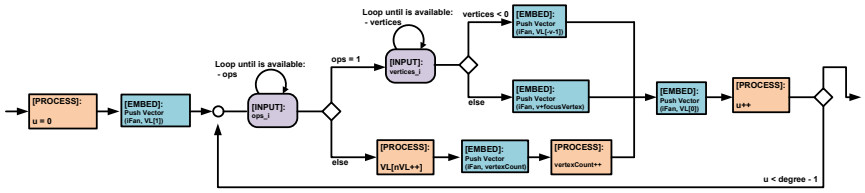
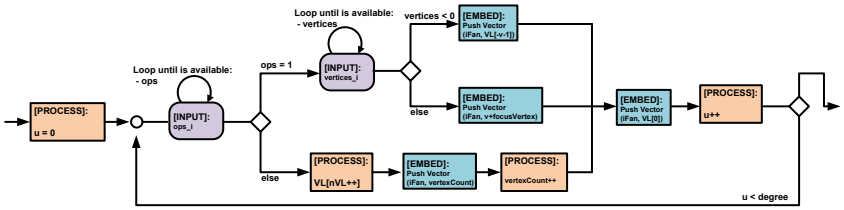
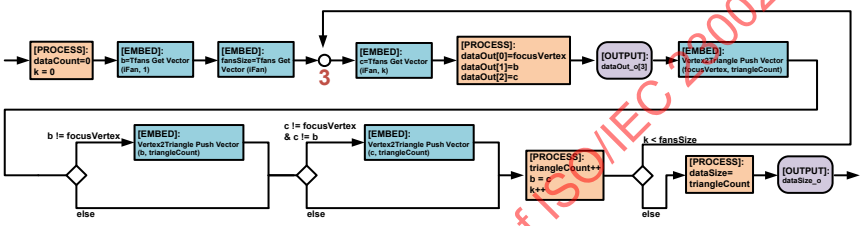
CASE = 8



CASE = 9



Compute dataOut:



Decode Connectivity TFAN Process:

EMBED: **Get Number of FANS and Max TFANS dim**

```
j = 0
INPUT: nFans
WHILE j < nFans
    INPUT: fans[]
    Number_FANS += fans[j]
    k = 0
    WHILE k < Number_FANS
        INPUT: degree[]
        IF Max_TFANS_dim < degree + 1
            Max_TFANS_dim = degree + 1
        k = k +1
    j = j + 1
```

EMBED: **Get all conquested vertices adjacent to the focused vertex**

```
focusVertex = 0
iFan = 0
j = 0
k = 0
if focusVertex = vertexCount
    vertexCount++
nFan = fans [
nL = 0
EMBED: vector size  = Vertex2Triangle Get Vector ( focusVertex )
WHILE j != vector size
    t = EMBED: vector size  = Vertex2Triangle Get Vector (focusVertex,j)
    WHILE k != 3
        v = data[t*3+k]
        IF v > focusVertex
            L[nL]=v
            nL++
        k++
    j++
```

EMBED: **Compute tfans according to the defined cases**

```
f = 0
iDegree = 0
iCase = 0
iOps=0
iVertices=0
WHILE f != nFan
```

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```
    INPUT: cases[]
    degree = degree[iDegree]
    case = cases[iCase]
    EMBED: tFan Push Vector (iFan,focusVector)
    SWITCH case
        case = 0: EMBED: CASE 0
        case = 1: EMBED: CASE 1
        case = 2: EMBED: CASE 2
        case = 3: EMBED: CASE 3
        case = 4: EMBED: CASE 4
        case = 5: EMBED: CASE 5
        case = 6: EMBED: CASE 6
        case = 7: EMBED: CASE 7
        case = 8: EMBED: CASE 8
        case = 9: EMBED: CASE 9
    f++

EMBED: CASE 0
u=0
EMBED: tFan Push Vector (iFan,VL[0])
WHILE u != degree-1
    VL[nVL++]=vertexCount
    EMBED: tFan Push Vector (iFan,vertexCount)
    u++
EMBED: tFan Push Vector (iFan,VL[1])

EMBED: CASE 1
u=0
iOps=0
iVertices=0
EMBED: tFan Push Vector (iFan,VL[0])
WHILE u != degree-1
    INPUT: ops[]
    IF ops[iOps] = 1
        INPUT: vertices[]
        v = vertices[iVertices]
        IF v < 0
            EMBED: tFan Push Vector (iFan,VL[-v-1])
        ELSE
            EMBED: tFan Push Vector (iFan,v+focusVertex)
    ELSE
        VL[nVL++]=vertexCount
        EMBED: tFan Push Vector (iFan,vertexCount)
        nVL++
        vertexCount++
    u++
EMBED: tFan Push Vector (iFan,VL[1])

EMBED: CASE 2
u=0
WHILE u != degree-1
    VL[nVL]=vertexCount
    EMBED: tFan Push Vector (iFan,vertexCount)
    nVL++
    vertexCount++
    u++
EMBED: tFan Push Vector (iFan,VL[0])

EMBED: CASE 3
u=0
WHILE u != degree-1
    VL[nVL]=vertexCount
    EMBED: tFan Push Vector (iFan,vertexCount)
    nVL++
    vertexCount++
    u++
EMBED: tFan Push Vector (iFan,VL[1])

EMBED: CASE 4
EMBED: tFan Push Vector (iFan,VL[0])
u=0
WHILE u != degree
    VL[nVL]=vertexCount
```

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```
        EMBED: tFan Push Vector (iFan,vertexCount)
        nVL++
        vertexCount++
        u++

EMBED: CASE 5
EMBED: tFan Push Vector (iFan,VL[1])
u=0
WHILE u != degree
        VL[nVL]=vertexCount
        EMBED: tFan Push Vector (iFan,vertexCount)
        nVL++
        vertexCount++
        u++

EMBED: CASE 6
u=0
WHILE u != degree
        VL[nVL]=vertexCount
        EMBED: tFan Push Vector (iFan,vertexCount)
        nVL++
        vertexCount++
        u++

EMBED: CASE 7
EMBED: tFan Push Vector (iFan,VL[1])
u=0
WHILE u != degree-1
        VL[nVL]=vertexCount
        EMBED: tFan Push Vector (iFan,vertexCount)
        nVL++
        vertexCount++
        u++
EMBED: tFan Push Vector (iFan,VL[0])

EMBED: CASE 8
u=0
iOps=0
iVertices=0
EMBED: tFan Push Vector (iFan,VL[1])
WHILE u != degree-1
        INPUT: ops[]
        IF ops[iOps] = 1
                INPUT: vertices[]
                v = vertices[iVertices]
                IF v < 0
                        EMBED: tFan Push Vector (iFan,VL[-v-1])
                ELSE
                        EMBED: tFan Push Vector (iFan,v+focusVertex)
        ELSE
                VL[nVL++]=vertexCount
                EMBED: tFan Push Vector (iFan,vertexCount)
                nVL++
                vertexCount++
        u++
EMBED: tFan Push Vector (iFan,VL[0])

EMBED: CASE 9
u=0
WHILE u != degree
        INPUT: ops[]
        IF ops[iOps] = 1
                INPUT: vertices[]
                v = vertices[iVertices]
                IF v < 0
                        EMBED: tFan Push Vector (iFan,VL[-v-1])
                ELSE
                        EMBED: tFan Push Vector (iFan,v+focusVertex)
        ELSE
                VL[nVL++]=vertexCount
                EMBED: tFan Push Vector (iFan,vertexCount)
                nVL++
                vertexCount++
```

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```
        u++

EMBED: Compute dataOut
k=2
dataCount=0
b=EMBED: tFan Get Vector (iFan,1)
fansSize=EMBED: tFan Get Vector (iFan)
WHILE k < fansSize
        c=EMBED: tFan Get Vector (iFan,k)
        dataOut[0]=focusVertex
        dataOut[1]=b
        dataOut[2]=c
        EMBED:Vertex2Triangle Push Vector(focusVertex,triangleCount)
        IF b != focusVertex
                EMBED:Vertex2Triangle Push Vector(b,triangleCount)
        IF c != focusVertex & c!= b
                EMBED:Vertex2Triangle Push Vector(c,triangleCount)
        triangleCount++
        b=c
        k++
OUTPUT: dataOut[]
OUTPUT: dataSize
```

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	MPEG-4 Part 16 SC3DMC TFAN
Input	
Name	**Token**
nFans_i	UINT8, UINT16, UINT32, UINT64
fans_i	UINT8, UINT16, UINT32, UINT64
degrees_i	UINT8, UINT16, UINT32, UINT64
cases_i	UINT8, UINT16, UINT32, UINT64
ops_i	UINT8, UINT16, UINT32, UINT64
vertices_i	UINT8, UINT16, UINT32, UINT64
Output	
Name	**Token**
dataOut_o	UINT8, UINT16, UINT32, UINT64
Parameter	

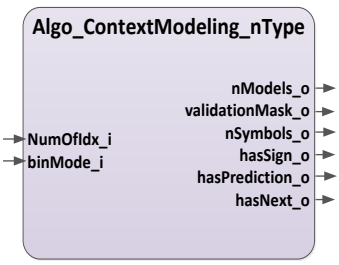
Name	**Description**	**Range**

Package
package org.sc29.wg11.mpeg4.part16

9.4 MPEG-4 SC3DMC SVA Specific FUs

9.4.1 Algo_ContextModeling_SVA_nType

FU Name	Algo_ContextModeling_SVA_nType
Description	This FU describes how to generate the context model of "nType" in the arithmetic decoding process.



Port Name	Direction (I/O)	Token RANGE
NumOfIdx_i	I	UINT8, UINT16, UINT32, UINT64
binMode_i	I	UINT_8
nModels_o	O	UINT8, UINT16, UINT32, UINT64
validationMask_o	O	BOOLEAN
nSymbols_o	O	UINT32,UINT64
hasSign_o	O	BOOLEAN
hasPrediction_o	O	BOOLEAN
hasNext_o	O	BOOLEAN

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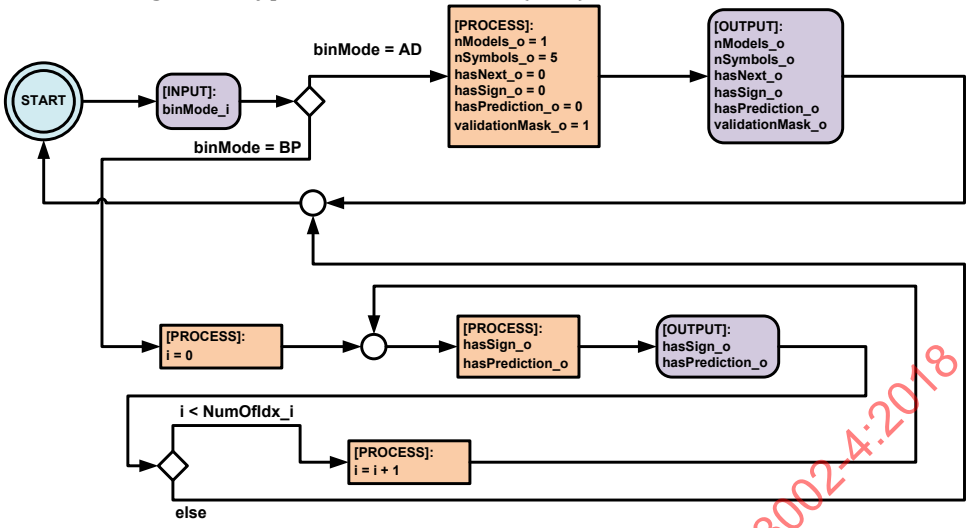
ContextModeling_SVA_nType Process Schematic (FSM):



ContextModeling_SVA_nType Process:

```
START
INPUT:
   numOfIdx_i
   binMode_i
IF binMode = AD
   nModels = 1
   nSymbols = 5
   hasNext = 0
   hasSign = 0
   hasPrediction = 0
   validationMask=1
OUTPUT:
   nModels_o
   nSymbols_o
   hasNext_o
   hasSign_o
   hasPrediction_o
   validationMask_o
GOTO START

ELSE IF binMode = BP
   i = 0
   BP_PROCESS:
   hasSign = 0
   hasPrediction = 0
 OUTPUT:
   hasSign_o
   hasPrediction_o
IF i < numOfIdx
        i++
     GOTO BP_PROCESS
ELSE GOTO START
```

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	MPEG-4 Part 16 SC3DMC SVA
Input	
Name	**Token**
NumOfIdx_i	UINT8, UINT16, UINT32, UINT64
binMode_i	UINT_8
Output	
Name	**Token**
nModels_o	UINT8, UINT16, UINT32, UINT64
validationMask_o	BOOLEAN
nSymbols_o	UINT32,UINT64

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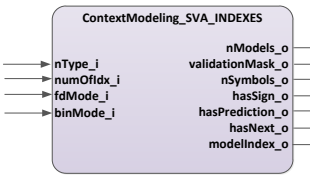
hasSign_o	BOOLEAN	
hasPrediction_o	BOOLEAN	
hasNext_o	BOOLEAN	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part16		

9.4.2 Algo_ContextModeling_SVA_Indexes

FU Name: Algo_ContextModeling_SVA_Indexes

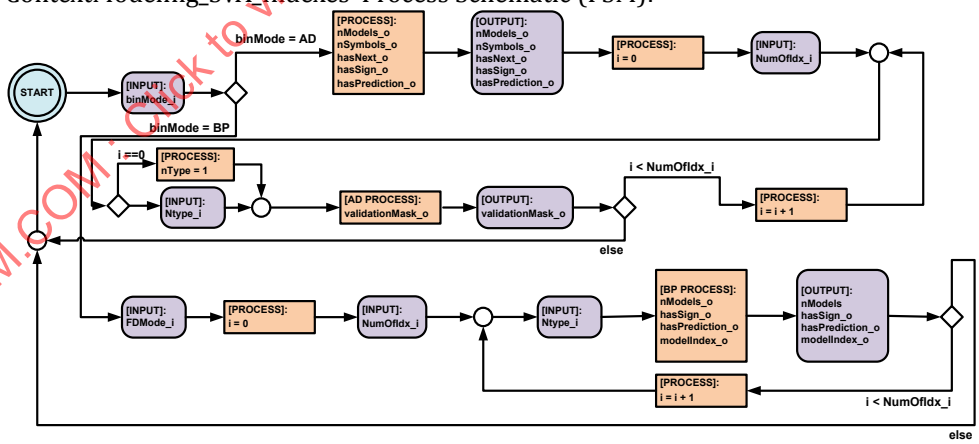
Description

This FU describes how to generate context models of "connectivity" depending on the nType and the binarization mode.



Port Name	Direction (I/O)	Token RANGE
nType_i	I	UINT8, UINT16, UINT32, UINT64
numOfIdx_i	I	UINT8, UINT16, UINT32, UINT64
fdMode_i	I	UINT8, UINT16, UINT32, UINT64
binMode_i	I	UINT_8
nModels_o	O	UINT_8
validationMask_o	O	BOOLEAN
nSymbols_o	O	UINT8, UINT16, UINT32, UINT64
hasSign_o	O	BOOLEAN
hasPrediction_o	O	BOOLEAN
hasNext_o	O	BOOLEAN
modelIndex_o	O	UINT8, UINT16, UINT32, UINT64

ContextModeling_SVA_Indexes Process Schematic (FSM):



ContextModeling_SVA_Indexes Process:

START
INPUT:
  binMode_i
IF binMode = AD
  nModels = 4
  nSymbols = {3, 2, 1024, 3}
  hasNext = {0, 0, 1, 0}
  hasSign = {0, 0, 1, 0}
  hasPrediction = {0, 0, 0, 0}
  delimTableSize = 4
  delimTable = {0, 2^{10}, 2^{20}, 2^{30}}
  OUTPUT:
    nModels
    nSymbols

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```
            hasNext
            hasSign
            hasPrediction
            delimTableSize
            delimTable
      i = 0
      AD VALIDATION
      IF i==0
         nType = 1
      ELSE
       INPUT:
            nType_i
          IF nType = 0
               validationMask = {1,1,1,1,0,0,0,0,0,0,0,0}
          ELSE IF nType = 1
               validationMask = {0,0,1,0,0,0,1,0,0,0,1,0}
          ELSE IF nType = 2
               validationMask = {1,0,1,0,0,0,1,1,0,0,0,0}
          ELSE IF nType = 3
               validationMask = {0,0,1,0,0,0,1,0,0,0,1,0}
               ELSE IF nType = 4
                    validationMask = {0,1,0,1,0,0,0,0,0,0,0,0}
       OUTPUT:
            validationMask_o
             IF i < numOfIdx
                    i = i + 1
                    GOTO AD VALIDATION
            ELSE GOTO START

ELSE IF binMode = BP
       i = 0
      BP PROCESS
      INPUT:
                FDMode_i
                numOfIdx_i
       IF i = 0
                nType = 1
       ELSE
                INPUT: nType_i
      IF FDMode = 0
                 IF nType = 0
                  nModels = 3
                    hasSign = {0,1,0}
                    hasPrediction = {0,1,0}
                     modelIndex = {0,2,3}
                ELSE IF nType = 1
                  nModels = 3
                     hasSign = {1,1,1}
                     hasPrediction = {1,1,1}
                     modelIndex = {2,2,2}
                 ELSE IF nType = 2
                   nModels = 4
                     hasSign = {0,1,1,0}
                     hasPrediction = {0,1,1,0}
                     modelIndex = {0,2,2,3}
                ELSE IF nType = 3
                  nModels = 3
                     hasSign = {1,1,1}
                     hasPrediction = {1,1,1}
                     modelIndex = {2,2,2}
                ELSE IF nType = 4
                  nModels = 1
                     hasSign = {0}
                     hasPrediction = {0}
                     modelIndex = {3}
       ELSE IF FDMode = 1
                IF nType = 0
                  nModels = 4
                    hasSign = {0,0,1,0}
                    hasPrediction = {0,0,1,0}
                    modelIndex = {0,1,2,3}
                ELSE IF nType = 1
                  nModels = 3
```

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```
                hasSign = {1,1,1}
                hasPrediction = {1,1,1}
                modelIndex = {2,2,2}
            ELSE IF nType = 2
              nModels = 4
                hasSign = {0,1,1,0}
                hasPrediction = {0,1,1,0}
                modelIndex = {0,2,2,3}
            ELSE IF nType = 3
              nModels = 3
                hasSign = {1,1,1}
                hasPrediction = {1,1,1}
                modelIndex = {2,2,2}
            ELSE IF nType = 4
              nModels = 2
                hasSign = {0,0}
                hasPrediction = {0,0}
                modelIndex = {1, 3}

        OUTPUT:
            nModels_o
                hasSign_o
                hasPrediction_o
                modelIndex_o

        IF i < numOfIdx
            i = i + 1
            GOTO BP PROCESS
    ELSE GOTO START
```

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	MPEG-4 Part 16 SC3DMC SVA

Input	
Name	**Token**
nType_i	UINT8, UINT16, UINT32, UINT64
numOfIdx_i	UINT8, UINT16, UINT32, UINT64
fdMode_i	UINT8, UINT16, UINT32, UINT64
binMode_i	UINT_8
Output	
Name	**Token**
nModels_o	UINT_8
validationMask_o	BOOLEAN
nSymbols_o	UINT8, UINT16, UINT32, UINT64
hasSign_o	BOOLEAN
hasPrediction_o	BOOLEAN
hasNext_o	BOOLEAN
modelIndex_o	UINT8, UINT16, UINT32, UINT64

Parameter		
Name	**Description**	**Range**

Package
package org.sc29.wg11.mpeg4.part16

9.4.3 Algo_ContextModeling_SVA_Vertex_Attribute

FU Name	Algo_ContextModeling_SVA_Vertex_Attribute
Description	This FU describes how to generate the context model of “vertex attribute” such as coordinate, normal, color, etc., in the arithmetic decoding process.

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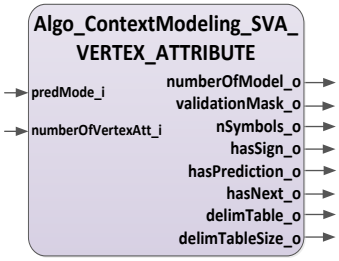
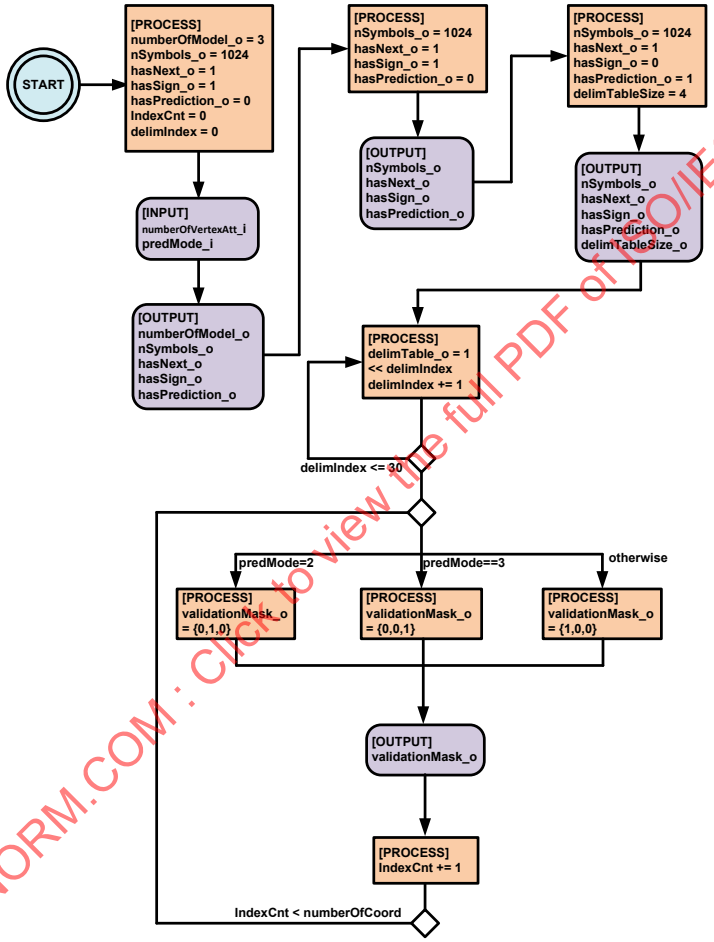


Port Name	Direction (I/O)	Token RANGE
predMode_i	I	UINT_4
numberOfCoord_i	I	UINT8, UINT16, UINT32, UINT64
numberOfModel_o	O	UINT8, UINT16, UINT32, UINT64
validationMask_o	O	BOOLEAN
nSymbols_o	O	UINT8, UINT16, UINT32, UINT64
hasSign_o	O	BOOLEAN
hasPrediction_o	O	BOOLEAN
hasNext_o	O	BOOLEAN
delimTable_o	O	UINT8, UINT16, UINT32, UINT64
delimTableSize_o	O	UINT8, UINT16, UINT32, UINT64

ContextModeling_SVA_Vertex_Attribute Process Schematic (FSM):



ContextModeling_SVA_Vertex_Attribute Process:

numberOfModel_o = 3
IndexCnt = 0

// Data type 1 symbol
nSymbols_o = 1024
hasNext_o = 1
hasSign_o = 1
hasPrediction_o = 0

// Data type 2 symbol
nSymbols_o = 1024

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```
hasNext_o = 1
hasSign_o = 0
hasPrediction_o = 0

// Data type 3 symbol
nSymbols_o = 1024
hasNext_o = 1
hasSign_o = 0
hasPrediction_o = 1

delimTableSize_o = 4
for ( delimIndex = 0; delimIndex <= 30; delimIndex += 10 )
   delimTable_o = 1 << delimIndex
  for (; IndexCnt < numberOfVertxAtt; IndexCnt++ ) {
      if ( predMode == 2 )
          validationMask_o = {0, 1, 0}
      else if ( predMode == 3 )
          validationMask_o = {0, 0, 1}
              else
                  validationMask_o = {1, 0, 0}
```

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	MPEG-4 Part 16 SC3DMC SVA

Input	
Name	**Token**
predMode_i	UINT_4
numberOfCoord_i	UINT8, UINT16, UINT32, UINT64

Output	
Name	**Token**
numberOfModel_o	UINT8, UINT16, UINT32, UINT64
validationMask_o	BOOLEAN
nSymbols_o	UINT8, UINT16, UINT32, UINT64
hasSign_o	BOOLEAN
hasPrediction_o	BOOLEAN
hasNext_o	BOOLEAN
delimTable_o	UINT8, UINT16, UINT32, UINT64
delimTableSize_o	UINT8, UINT16, UINT32, UINT64

Parameter		
Name	**Description**	**Range**

Package
package org.sc29.wg11.mpeg4.part16

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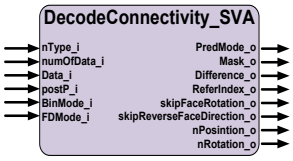
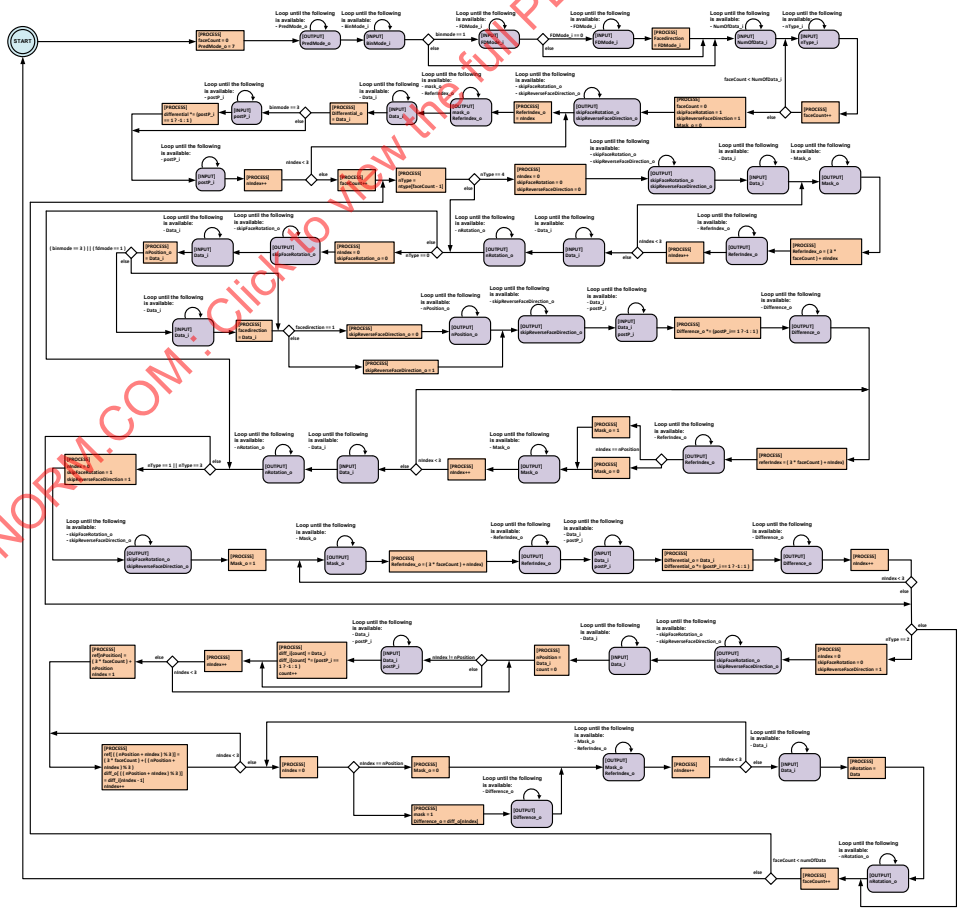
9.4.4 Algo_DecodeConnectivity_SVA

FU Name	Algo_DecodeConnectivity_SVA
Description	This FU describes the connectivity decoding process for SVA.



Port Name	Direction (I/O)	Token RANGE
nType_i	I	UINT8, UINT16, UINT32, UINT64
NumOfData_i	I	UINT8, UINT16, UINT32, UINT64
Data_i	I	UINT8, UINT16, UINT32, UINT64
postP_i	I	BOOLEAN
BinMode_i	I	UINT_8
FDMode_i	I	UINT8, UINT16, UINT32, UINT64
Mask_o	O	UINT8, UINT16, UINT32, UINT64
Difference_o	O	UINT8, UINT16, UINT32, UINT64
ReferIndex_o	O	UINT8, UINT16, UINT32, UINT64
PredMode_o	O	UINT_8
skipFaceRotation_o	O	BOOLEAN
skipReverseFaceDirection_o	O	BOOLEAN
nPosition_o	O	UINT8, UINT16, UINT32, UINT64
nRotation_o	O	UINT8, UINT16, UINT32, UINT64

DecodeConnectivity_SVA Process Schematic (FSM):



ConnectivityDecoding SVA Process:

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```
START
faceCount = 0
PredMode_o = 7
OUTPUT:PredMode_o
INPUT:BinMode_i

IF ( binmode == 1 )
INPUT:FDMode_i
IF ( FDMode_i == 0 )
INPUT:FDMode_i
facedirection = FDMode_i;
ENDIF
ENDIF

INPUT:NumOfData_i
while ( faceCount < NumOfData_i )
INPUT:nType_i
faceCount++
ENDWHILE

faceCount = 0;
skipFaceRotation = 1;
skipReverseFaceDirection = 1;
mask_o = 0
OUTPUT:skipFaceRotation_o
OUTPUT:skipReverseFaceDirection_o
mask_o = 0
WHILE ( nIndex < 3 )
ReferIndex_o = nIndex
OUTPUT:Mask_o
OUTPUT:ReferIndex_o
INPUT:Data_i
Differential_o = Data_i

IF ( binmode == 3 )
INPUT: postP_i
Differential_o *= (postP_i == 1 ? -1 : 1 );
ENDIF

OUTPUT:Difference_o
nIndex++
ENDIF

faceCount++

WHILE ( faceCount < numOfData ) {
nType = ntype[faceCount - 1];

IF ( nType == 4 )
nIndex = 0;
skipFaceRotation = 0;
skipReverseFaceDirection = 0;
OUTPUT:skipFaceRotation_o
OUTPUT:skipReverseFaceDirection_o
INPUT:Data_i
WHILE ( nIndex < 3 ) {
OUTPUT:Mask_o
ReferIndex_o = ( 3 * faceCount ) + nIndex;
OUTPUT:ReferIndex_o
nIndex++
ENDWHILE
INPUT:Data_i
OUTPUT:nRotation_o
ENDIF

  ELSEIF ( nType == 0 )
nIndex = 0;
skipFaceRotation = 0;
OUTPUT:skipFaceRotation_o
INPUT:Data_i
nPosition_o = Data_i

IF ( ( binmode == 3 ) || ( fdmode == 1 ) )
```

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```
INPUT:Data_i
facedirection = Data_i
ENDIF

IF ( facedirection == 1 ) {
skipReverseFaceDirection = 0
OUTPUT:nPosition_o
ELSE
skipReverseFaceDirection_o = 1

OUTPUT:skipReverseFaceDirection_o
INPUT:Data_i
INPUT: postP_i
Differential_o *= (postP_i== 1 ? -1 : 1 );
OUTPUT:Difference_o
WHILE ( nIndex < 3 ) {
referIndex = ( 3 * faceCount ) + nIndex;
OUTPUT:ReferIndex_o
IF ( nIndex == nPosition )
Mask_o = 1
ELSE
Mask_o = 0
OUTPUT:Mask_o
nIndex++
ENDWHILE
INPUT:Data_i
OUTPUT:nRotation_o
ENDIF

ELSE IF ( nType == 1 || nType == 3 ) {
nIndex = 0
skipFaceRotation = 1
skipReverseFaceDirection = 1
OUTPUT:skipFaceRotation_o
OUTPUT:skipReverseFaceDirection_o
Mask_o = 1
while ( nIndex < 3 ) {
OUTPUT:Mask_o
referIndex = ( faceCount * 3 ) + nIndex
OUTPUT:ReferIndex_o
INPUT:Data_i
INPUT: postP_i
Differential_o = Data_i
Differential_o *= (postP_i == 1 ? -1 : 1 )
OUTPUT:Difference_o
nIndex++
ENDWHILE
ENDIF

ELSE IF ( nType == 2 )
nIndex = 0
skipFaceRotation = 0
skipReverseFaceDirection = 1
OUTPUT:skipFaceRotation_o
OUTPUT:skipReverseFaceDirection_o
INPUT:Data_i
nPosition = Data_i
count = 0
WHILE ( nIndex < 3 ) {
IF  ( nIndex != nPosition )
INPUT:Data_i
INPUT: postP_i
diff_i[count] = Data_i
diff_i[count] *= (postP_i == 1 ? -1 : 1 );
count++
ENDIF
nIndex++
ENDWHILE
ref[nPosition] = ( 3 * faceCount ) + nPosition;
nIndex = 1
WHILE ( nIndex < 3 )
ref[ ( ( nPosition + nIndex ) % 3 )] = ( 3 * faceCount ) + ( ( nPosition + nIndex ) % 3 );
diff_o[ ( ( nPosition + nIndex ) % 3 )] = diff_i[nIndex - 1]
```

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	nIndex++
	ENDWHILE
	nIndex = 0
	WHILE (nIndex < 3) {
	IF (nIndex == nPosition)
	mask = 0
	ELSE
	mask = 1
	Difference_o = diff_o[nIndex]
	OUTPUT:Difference_o
	ENDELSE
	ReferIndex_o = ref[nIndex]
	OUTPUT:Mask_o
	OUTPUT:ReferIndex_o
	nIndex++
	ENDWHILE
	INPUT:Data_i
	nRotation = Data
	OUTPUT:nRotation_o
	ENDIF
	faceCount++
	ENDWHILE

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	MPEG-4 Part 16 SC3DMC SVA

Input	
Name	**Token**
nType_i	UINT8, UINT16, UINT32, UINT64
NumOfData_i	UINT8, UINT16, UINT32, UINT64
Data_i	UINT8, UINT16, UINT32, UINT64
postP_i	BOOLEAN
BinMode_i	UINT_8
FDMode_i	UINT8, UINT16, UINT32, UINT64

Output	
Name	**Token**
Mask_o	UINT8, UINT16, UINT32, UINT64
Difference_o	UINT8, UINT16, UINT32, UINT64
ReferIndex_o	UINT8, UINT16, UINT32, UINT64
PredMode_o	UINT_8
skipFaceRotation_o	BOOLEAN
skipReverseFaceDirection_o	BOOLEAN
nPosition_o	UINT8, UINT16, UINT32, UINT64
nRotation_o	UINT8, UINT16, UINT32, UINT64

Parameter		
Name	**Description**	**Range**

Package
package org.sc29.wg11.mpeg4.part16

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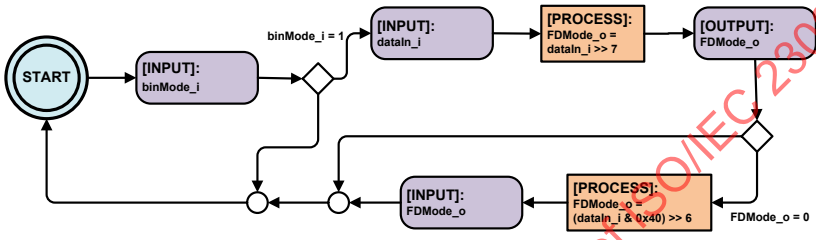
9.4.5 Algo_ExtractFaceDirection_SVA

FU Name	Algo_ExtractFaceDirection_SVA
Description	

Port Name	Direction (I/O)	Token RANGE
dataIn_i	I	UINT_8
binMode_i	I	UINT_8
FDMode_o	O	UINT8, UINT16, UINT32, UINT64

Algo_ExtractFaceDirection_SVA Schematic (FSM):



Algo_ExtractFaceDirection_SVA Process:

```
START:
INPUT:
 binMode_i
IF binMode_i = 1
   INPUT:
      dataIn_i
 PROCESS:
          FDMode_o = dataIn_i >> 7;
 OUTPUT:
     FDMode_o
 IF FDMode_o = 0
     PROCESS:
                FDMode_o = (dataIn_i & 0x40) >> 6
     OUTPUT:
       FDMode_o
GOTO START
```

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	MPEG-4 Part 16 SC3DMC SVA

Input	
Name	**Token**
dataIn_i	UINT_8
binMode_i	UINT_8

Output	
Name	**Token**
FDMode_o	UINT8, UINT16, UINT32, UINT64

Parameter		
Name	**Description**	**Range**

Package
package org.sc29.wg11.mpeg4.part16

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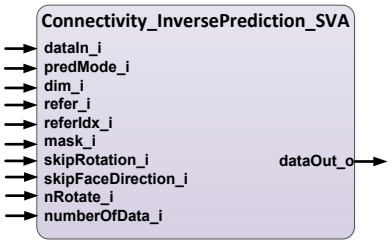
9.4.6 Algo_Connectivity_InversePrediction_SVA

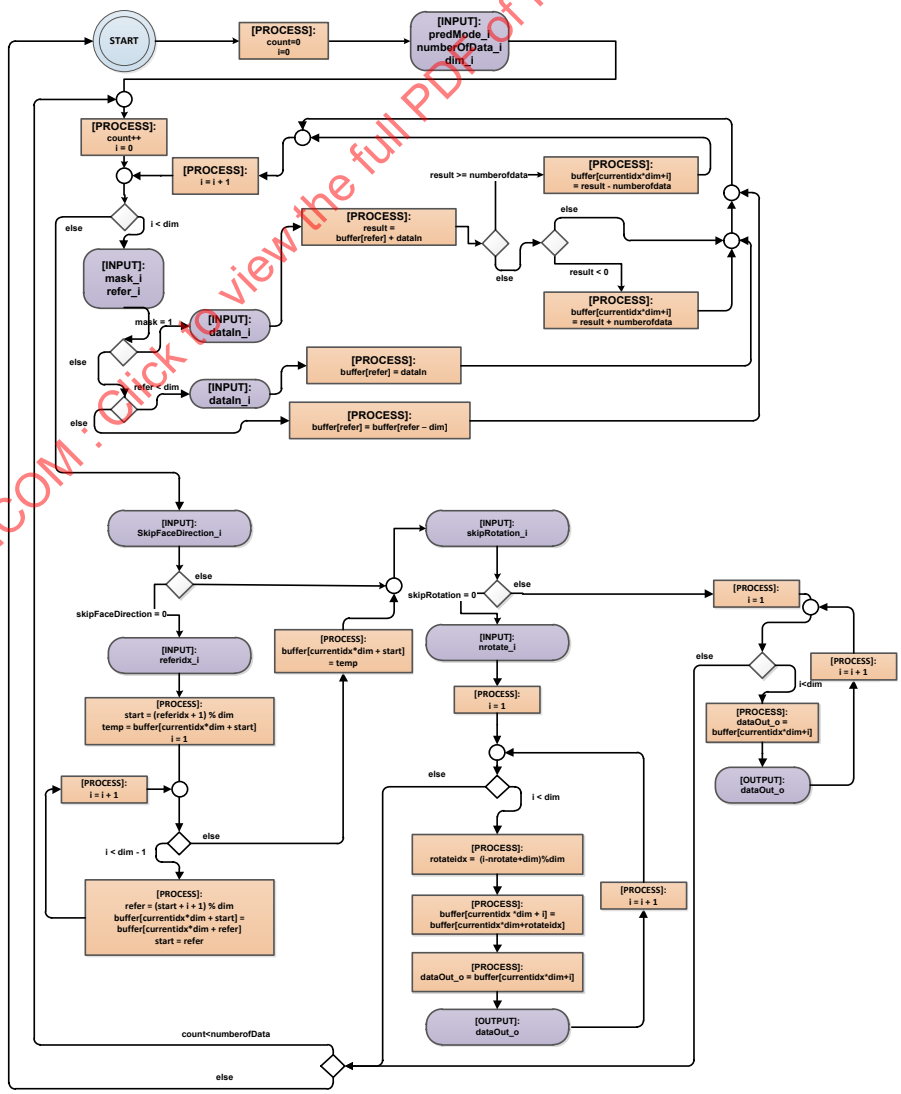
FU Name	Algo_Connectivity_InversePrediction_SVA

Description



Port Name	Direction (I/O)	Token RANGE
dataIn_i	I	INT8, INT16, INT32, INT64
predMode_i	I	UINT_4
dim_i	I	UINT8, UINT16, UINT32, UINT64
refer_i	I	UINT8, UINT16, UINT32, UINT64
referIdx_i	I	UINT8, UINT16, UINT32, UINT64
mask_i	I	BOOLEAN
skipRotation_i	I	BOOLEAN
skipFaceDirection_i	I	BOOLEAN
nRotate_i	I	UINT8, UINT16, UINT32, UINT64
numberOfData_i	I	UINT8, UINT16, UINT32, UINT64
dataOut_o	O	INT8, INT16, INT32, INT64

Connectivity_InversePrediction_SVA Schematic (FSM):



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Connectivity_Inverse Prediction_SVA Process:

```
START:

INPUT :      PredictionMode_i
        numberOfData_i
        dim_i
currentidx =0
i = 0

WHILE(currentidx < numberOfData)
     WHILE(i < dim)
        INPUT: refer_i
   INPUT: mask_i
        IF mask = 1
                INPUT : dataIn_i
                result = buffer[refer] + dataIn
                IF (result >= numberOfData)
                        buffer[currentidx*dim + i] = result – numberOfData
                IF (result < 0)
                        buffer[currentidx*dim + i]= result + numberOfData
        ELSE
        IF (refer < 3)
           INPUT : dataIn_i
             buffer[refer] = dataIn
       ELSE
           buffer[refer] = buffer[refer - dim]
          i = i + 1

   INPUT:    skipFaceDirection_i
    IF skipFaceDirection = 0
   INPUT : referIdx_i
   start = (referIdx + 1) % dim
   temp = buffer[currentidx*dim + start]
   i = 1
   WHILE i < dim - 1
            refer = (start + i + 1) % dim
            buffer[currentidx*dim + start] =
                buffer[currentidx*dim + refer]
     start = refer
     i = i + 1
   buffer[currentidx*dim + start] = temp
   INPUT:    skipRotation_i
    IF (skipRotation = 0)
        INPUT : nRotate_i
        i = 0
   WHILE(i < dim)
     rotateidx = (i - nRotate + dim) % dim
           buffer[currentidx*dim + i] = buffer[currentidx*dim+rotateidx]
           dataOut_o = buffer[currentidx*dim + i]
           OUTPUT: dataOut_o
           i = i + 1
       ELSE
        WHILE(i < dim)
            dataOut_o = buffer[currentidx*dim + i]
            OUTPUT: dataOut_o
            i = i + 1
  currentidx ++
GOTO START
```

ISO Standards using the FU	ISO/IEC 14496-16
Profiles@levels supported	MPEG-4 Part 16 SC3DMC SVA

Input

Name	**Token**
dataIn_i	INT8, INT16, INT32, INT64
predMode_i	UINT_4
dim_i	UINT8, UINT16, UINT32, UINT64
refer_i	UINT8, UINT16, UINT32, UINT64
referIdx_i	UINT8, UINT16, UINT32, UINT64

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mask_i	BOOLEAN	
skipRotation_i	BOOLEAN	
skipFaceDirection_i	BOOLEAN	
nRotate_i	UINT8, UINT16, UINT32, UINT64	
numberOfData_i	UINT8, UINT16, UINT32, UINT64	
Output		
Name	**Token**	
dataOut_o	INT8, INT16, INT32, INT64	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpeg4.part16		

10 FUs for HEVC Main Profile

10.1 General

FUs for building an HEVC (ISO/IEC 23008-2) Main Profile decoder are described in this clause.

10.2 Syntax parsing

10.2.1 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

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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.mpegh.part2.main.synParser		

10.3 Texture decoding

10.3.1 Algo_IntraPrediction

FU Name	Algo_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**	
CUInfo	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		

10.3.2 selectCU

FU Name	Algo_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	

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Name	Token	
Sample	uint(size=8) token	
Parameter		
Name	**Description**	**Range**
Package		
package org.sc29.wg11.mpegh.part2.main.intra		

10.4 Motion compensation

10.4.1 Algo_InterPrediction

FU Name	Algo_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.mpegh.part2.main.inter		

10.4.2 Mgnt_DecodedPictureBuffer

FU Name	Mgnt_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		

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

10.4.3 Algo_GenerateRefList

FU Name	Algo_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.mpegh.part2.main.inter		

10.4.4 Algo_MvComponentPred

FU Name	Algo_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.mpegh.part2.main.inter		

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10.5 Filtering

10.5.1 Algo_SaoFilter

FU Name	Algo_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.mpegh.part2.main.Filters		

10.5.2 Algo_GenerateBs

FU Name	Algo_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.mpegh.part2.main.Filters		

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10.5.3 Algo_DeblockingFilter

FU Name	Algo_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.mpegh.part2.main.Filters		

10.5.4 Algo_QpGen

FU Name	Algo_QpGen	
Description	This FU computes the Qp for 8×8, 16×16, 32×32, and 64×64 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.mpegh.part2.main.Filters		

10.6 MD5 check

10.6.1 Mgnt_MD5SplitInfo

FU Name	Mgnt_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

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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.mpegh.part2.common		

10.6.2 Mgnt_padding

FU Name	Mgnt_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.mpegh.part2.common		

10.6.3 Mgnt_MD5Shifter

FU Name	Mgnt_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		

10.6.4 Mgnt_MD5Compute

FU Name	Mgnt_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**

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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		

10.7 Inverse transforms

10.7.1 Mgnt_IT_Splitter

FU Name	Mgnt_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		

10.7.2 Mgnt_IT_Merger

FU Name	Mgnt_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		

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10.7.3 Mgnt_Block_Merger

FU Name	Mgnt_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		

10.7.4 Mgnt_Transpose_4x4

FU Name	Mgnt_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		

10.7.5 Mgnt_Transpose_8x8

FU Name	Mgnt_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		

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10.7.6 Mgnt_Transpose_16x16

FU Name	Mgnt_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		

10.7.7 Mgnt_Transpose_32x32

FU Name	Mgnt_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.mpegh.part2.main.IT		

10.7.8 Mgnt_Transpose_32x32

FU Name	Mgnt_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.mpegh.part2.main.IT		

10.7.9 Algo_IT4x4_1d

FU Name	Algo_IT4x4_1d

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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		

10.7.10 Algo_IT8x8_1d

FU Name	Algo_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		

10.7.11 Algo_IT16x16_1d

FU Name	Algo_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		

10.7.12 Algo_IT32x32_1d

FU Name	Algo_IT32x32_1d
Description	
Profiles@levels supported	HEVC Main Profile

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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		

10.7.13 Algo_invDST4x4_1st

FU Name	Algo_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		

10.7.14 Algo_invDST4x4_2nd

FU Name	Algo_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		

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Annex A
(normative)

Naming convention of FU

A.1 Functional Unit name convention

This annex details the convention used to name the Functional Units. Each Functional Unit has a unique name.

A.2 Simple Functional Units name convention

The skeleton of the names is in the following format:

{Role}_{Name}_[property1-property2-...-propertyN]_[size]_{STANDARD if exists}_[Ver_ID]

{...} → compulsory

[...] → optional

- → inside field separator

_ → separator between fields

Some examples:

— Mgnt_Address_mpeg4_16x16

— Algo_Interpolation_halfpel-mpeg4

— Algo_DCRaddressing_mpeg4_8x8

A.3 Description of the fields

{Role}

This part is compulsory. It specifies if this Functional Unit implements a specific coding algorithm or not. If the FU is a video coding tool, the "ALGO" tag shall be used (stands for "algorithmic content"). If not, the "MGNT" tag shall be used (stands for "data management").

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{Name}

1. This part is compulsory. This field corresponds to the name of the Functional Unit. It should describe as much as possible the action performed by the Functional Unit. In case of an "ALGO" type it may relate to the standard subclause title or to the (shorter) common name to refer to such specific algorithm. For the other Functional Unit, one would try to put a name which can be understood by the entire MPEG community.

[property]

This part is optional. It provides additional information about the Functional Unit. Several properties can be mentioned in the name.

The property field can be used to specify

— a given characteristic of the algorithm. For example, ALGO_Interpolation_halfpel, "Halfpel" being the property field,

— luminance of chrominance appliance: "LUMA" or "CHROMA". For example, ALGO_Name_Luma or ALGO_Name_Chroma, and

— an implementation: It provides any additional information about the implementation of the Functional Unit. If there are various algorithms for one Functional Unit, this field is use to distinguish them.

[size]

This part is optional. This field gives an indication concerning the amount of data the Functional Unit has been designed for. For example, the MGNT_Address_16x16 Functional Unit deals with blocks of 16×16 pixels.

{STANDARD if exists}

This tag indicates with which standard the Functional Unit is conformant with.

For example, algo_Interpolation_halfpel_mpeg4 means this FU is conformant with MPEG4 Part 2. Thus, the algorithm is described in the corresponding official document.

— standard appliance: "mpeg" + {2,4,avc}. For example, "mpeg24avc", "mpeg4avc", "mpeg4".

[Ver_ID]

This tag is used for revision of FU description.

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Annex B
(informative)

FU network examples

B.1 Value of the RVC descriptions

Value of the RVC descriptions	Description
0x00	Unspecified
0x01	Description of MPEG-4 Visual (ISO/IEC 14496-2) Simple Profile defined as Top_mpeg4_part2_SP_decoder.xdf
0x02	Description of AVC (ISO/IEC 14496-10) Constrained Baseline Profile defined as Top_mpeg4_part10_CBP_decoder.xdf
0x03	Description of AVC (ISO/IEC 14496-10) Progressive High Profile defined as Top_mpeg4_part10_PHP_decoder.xdf
0x04	Description of HEVC (ISO/IEC 23008-2) Main Profile defined as Top_mpegh_part2_main_decoder.xdf
0x05 ... 0xFFFF	Reserved
0xFFFF... 0xFFFFFFFF	User defined

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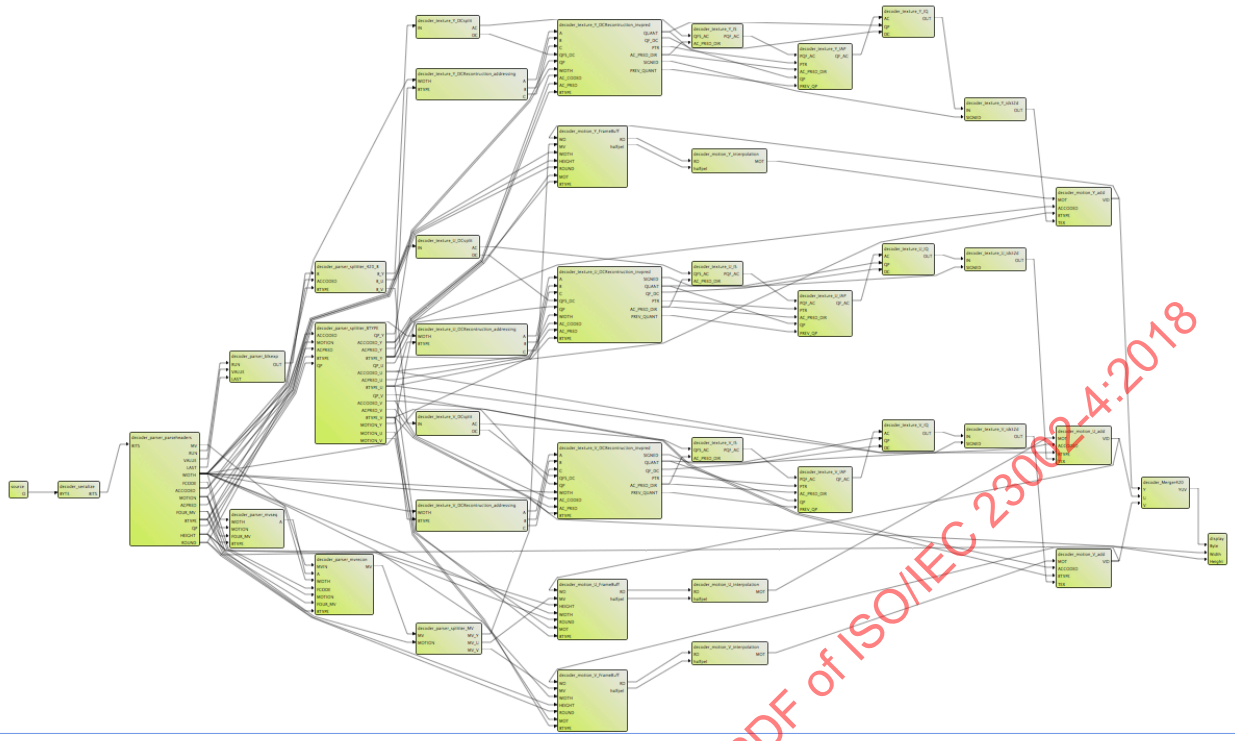
B.2 FNL of MPEG-4 Simple Profile



Complete example of the MPEG-4 SP decoder (Refer to Top_mpeg4_part2_SP_decoder.xdf file)

```
<?xml version="1.0" encoding="UTF-8"?>
<XDF name="Top_mpeg4_part2_SP_decoder">
  <Instance id="source">
    <Class name="org.sc29.wg11.stdio.Source"/>
  </Instance>
  <Instance id="display">
    <Class name="org.sc29.wg11.video.DisplayYUV"/>
  </Instance>
  <Instance id="decoder_serialize">
    <Class name="org.sc29.wg11.common.Algo_Byte2bit"/>
  </Instance>
  <Instance id="decoder_Merger420">
    <Class name="org.sc29.wg11.common.Mgnt_Merger420"/>
  </Instance>
  <Instance id="decoder_parser_parseheaders">
    <Class name="org.sc29.wg11.mpeg4.part2.sp.parser.Algo_SynP"/>
  </Instance>
  <Instance id="decoder_parser_mvseq">
    <Class name="org.sc29.wg11.mpeg4.part2.sp.parser.Mgnt_MVSequence_LeftAndTopAndTopRight"/>
  </Instance>
  <Instance id="decoder_parser_blkexp">
    <Class name="org.sc29.wg11.mpeg4.part2.sp.parser.Mgnt_BlockExpand"/>
  </Instance>
  <Instance id="decoder_parser_mvrecon">
    <Class name="org.sc29.wg11.mpeg4.part2.sp.parser.Mgnt_MVR_MedianOfThreeLeftAndTopAndTopRight"/>
  </Instance>
  <Instance id="decoder_parser_splitter_BTYPE">
    <Class name="org.sc29.wg11.mpeg4.part2.sp.parser.Mgnt_Splitter_420_TYPE"/>
  </Instance>
  <Instance id="decoder_parser_splitter_MV">
    <Class name="org.sc29.wg11.mpeg4.part2.sp.parser.Mgnt_Splitter420MV"/>
  </Instance>
  <Instance id="decoder_parser_splitter_420_B">
    <Class name="org.sc29.wg11.mpeg4.part2.sp.parser.Mgnt_Splitter420B"/>
  </Instance>
  <Instance id="decoder_texture_Y_DCsplit">
    <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Mgnt_DCSplit"/>
  </Instance>
  <Instance id="decoder_texture_Y_IS">
    <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IS_ZigzagOrAlternateHorizontalVertical_8x8"/>
  </Instance>
  <Instance id="decoder_texture_Y_IAP">
    <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IAP_AdaptiveHorizontalOrVerticalPred_16x16"/>
  </Instance>
```

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```
<Instance id="decoder_texture_Y_IQ">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IQ_QSAbdQmatrixMp4vOrH263Scaler"/>
</Instance>
<Instance id="decoder_texture_Y_idct2d">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IDCT2D_ISOIEC_23002_1"/>
</Instance>
<Instance id="decoder_texture_Y_DCRecontruction_addressing">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction.Algo_DCRAddr_ThreeLeftTop_16x16"/>
</Instance>
<Instance id="decoder_texture_Y_DCRecontruction_invpred">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction.Algo_DCRInvPred_LUMA_16x16"/>
</Instance>
<Instance id="decoder_texture_U_DCsplit">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Mgnt_DCSplit"/>
</Instance>
<Instance id="decoder_texture_U_IS">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IS_ZigzagOrAlternateHorizontalVertical_8x8"/>
</Instance>
<Instance id="decoder_texture_U_IAP">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IAP_AdaptiveHorizontalOrVerticalPred_8x8"/>
</Instance>
<Instance id="decoder_texture_U_IQ">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IQ_QSAbdQmatrixMp4vOrH263Scaler"/>
</Instance>
<Instance id="decoder_texture_U_idct2d">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IDCT2D_ISOIEC_23002_1"/>
</Instance>
<Instance id="decoder_texture_U_DCRecontruction_addressing">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction.Algo_DCRAddr_ThreeLeftTop_8x8"/>
</Instance>
<Instance id="decoder_texture_U_DCRecontruction_invpred">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction.Algo_DCRInvPred_CHROMA_8x8"/>
</Instance>
<Instance id="decoder_texture_V_DCsplit">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Mgnt_DCSplit"/>
</Instance>
<Instance id="decoder_texture_V_IS">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IS_ZigzagOrAlternateHorizontalVertical_8x8"/>
</Instance>
<Instance id="decoder_texture_V_IAP">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IAP_AdaptiveHorizontalOrVerticalPred_8x8"/>
</Instance>
<Instance id="decoder_texture_V_IQ">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IQ_QSAbdQmatrixMp4vOrH263Scaler"/>
</Instance>
<Instance id="decoder_texture_V_idct2d">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.Algo_IDCT2D_ISOIEC_23002_1"/>
</Instance>
<Instance id="decoder_texture_V_DCRecontruction_addressing">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction.Algo_DCRAddr_ThreeLeftTop_8x8"/>
</Instance>
<Instance id="decoder_texture_V_DCRecontruction_invpred">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.texture.dc_reconstruction.Algo_DCRInvPred_CHROMA_8x8"/>
</Instance>
<Instance id="decoder_motion_Y_interpolation">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.motion.Algo_Interp_HalfpelBilinearRoundingControl"/>
</Instance>
<Instance id="decoder_motion_Y_add">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.motion.Algo_PictureReconstruction_Saturation"/>
</Instance>
<Instance id="decoder_motion_Y_FrameBuff">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.motion.Mgnt_FB_w_Address_16X16"/>
</Instance>
<Instance id="decoder_motion_U_interpolation">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.motion.Algo_Interp_HalfpelBilinearRoundingControl"/>
</Instance>
<Instance id="decoder_motion_U_add">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.motion.Algo_PictureReconstruction_Saturation"/>
</Instance>
<Instance id="decoder_motion_U_FrameBuff">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.motion.Mgnt_FB_w_Address_8X8"/>
</Instance>
<Instance id="decoder_motion_V_interpolation">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.motion.Algo_Interp_HalfpelBilinearRoundingControl"/>
</Instance>
<Instance id="decoder_motion_V_add">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.motion.Algo_PictureReconstruction_Saturation"/>
</Instance>
<Instance id="decoder_motion_V_FrameBuff">
  <Class name="org.sc29.wg11.mpeg4.part2.sp.motion.Mgnt_FB_w_Address_8X8"/>
</Instance>
<Connection dst="decoder_parser_mvrecon" dst-port="MVIN"
  src="decoder_parser_parseheaders" src-port="MV"/>
<Connection dst="decoder_parser_blkexp" dst-port="RUN"
  src="decoder_parser_parseheaders" src-port="RUN"/>
<Connection dst="decoder_parser_blkexp" dst-port="VALUE"
```

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```
  src="decoder_parser_parseheaders" src-port="VALUE"/>
<Connection dst="decoder_parser_blkexp" dst-port="LAST"
  src="decoder_parser_parseheaders" src-port="LAST"/>
<Connection dst="decoder_parser_mvrecon" dst-port="A"
  src="decoder_parser_mvseq" src-port="A"/>
<Connection dst="decoder_parser_splitter_420_B" dst-port="B"
  src="decoder_parser_blkexp" src-port="OUT"/>
<Connection dst="decoder_parser_splitter_MV" dst-port="MV"
  src="decoder_parser_mvrecon" src-port="MV"/>
<Connection dst="decoder_parser_mvrecon" dst-port="WIDTH"
  src="decoder_parser_parseheaders" src-port="WIDTH"/>
<Connection dst="decoder_parser_mvseq" dst-port="WIDTH"
  src="decoder_parser_parseheaders" src-port="WIDTH"/>
<Connection dst="decoder_parser_mvrecon" dst-port="FCODE"
  src="decoder_parser_parseheaders" src-port="FCODE"/>
<Connection dst="decoder_parser_splitter_420_B" dst-port="ACCODED"
  src="decoder_parser_parseheaders" src-port="ACCODED"/>
<Connection dst="decoder_parser_splitter_BTYPE" dst-port="ACCODED"
  src="decoder_parser_parseheaders" src-port="ACCODED"/>
<Connection dst="decoder_parser_mvseq" dst-port="MOTION"
  src="decoder_parser_parseheaders" src-port="MOTION"/>
<Connection dst="decoder_parser_splitter_MV" dst-port="MOTION"
  src="decoder_parser_parseheaders" src-port="MOTION"/>
<Connection dst="decoder_parser_mvrecon" dst-port="MOTION"
  src="decoder_parser_parseheaders" src-port="MOTION"/>
<Connection dst="decoder_parser_splitter_BTYPE" dst-port="MOTION"
  src="decoder_parser_parseheaders" src-port="MOTION"/>
<Connection dst="decoder_parser_splitter_BTYPE" dst-port="ACPRED"
  src="decoder_parser_parseheaders" src-port="ACPRED"/>
<Connection dst="decoder_parser_mvseq" dst-port="FOUR_MV"
  src="decoder_parser_parseheaders" src-port="FOUR_MV"/>
<Connection dst="decoder_parser_mvrecon" dst-port="FOUR_MV"
  src="decoder_parser_parseheaders" src-port="FOUR_MV"/>
<Connection dst="decoder_parser_splitter_BTYPE" dst-port="BTYPE"
  src="decoder_parser_parseheaders" src-port="BTYPE"/>
<Connection dst="decoder_parser_mvseq" dst-port="BTYPE"
  src="decoder_parser_parseheaders" src-port="BTYPE"/>
<Connection dst="decoder_parser_splitter_420_B" dst-port="BTYPE"
  src="decoder_parser_parseheaders" src-port="BTYPE"/>
<Connection dst="decoder_parser_mvrecon" dst-port="BTYPE"
  src="decoder_parser_parseheaders" src-port="BTYPE"/>
<Connection dst="decoder_parser_splitter_BTYPE" dst-port="QP"
  src="decoder_parser_parseheaders" src-port="QP"/>
<Connection dst="decoder_parser_parseheaders" dst-port="BITS"
  src="decoder_serialize" src-port="BITS"/>
<Connection dst="decoder_texture_Y_IS" dst-port="QFS_AC"
  src="decoder_texture_Y_DCsplit" src-port="AC"/>
<Connection dst="decoder_texture_Y_IAP" dst-port="PQF_AC"
  src="decoder_texture_Y_IS" src-port="PQF_AC"/>
<Connection dst="decoder_texture_Y_IQ" dst-port="AC"
  src="decoder_texture_Y_IAP" src-port="QF_AC"/>
<Connection dst="decoder_texture_Y_idct2d" dst-port="IN"
  src="decoder_texture_Y_IQ" src-port="OUT"/>
<Connection dst="decoder_texture_Y_DCRecontruction_invpred"
  dst-port="A" src="decoder_texture_Y_DCRecontruction_addressing" src-port="A"/>
<Connection dst="decoder_texture_Y_DCRecontruction_invpred"
  dst-port="B" src="decoder_texture_Y_DCRecontruction_addressing" src-port="B"/>
<Connection dst="decoder_texture_Y_DCRecontruction_invpred"
  dst-port="C" src="decoder_texture_Y_DCRecontruction_addressing" src-port="C"/>
<Connection dst="decoder_texture_Y_IQ" dst-port="QP"
  src="decoder_texture_Y_DCRecontruction_invpred" src-port="QUANT"/>
<Connection dst="decoder_texture_Y_IQ" dst-port="DC"
  src="decoder_texture_Y_DCRecontruction_invpred" src-port="QF_DC"/>
<Connection dst="decoder_texture_Y_IAP" dst-port="PTR"
  src="decoder_texture_Y_DCRecontruction_invpred" src-port="PTR"/>
<Connection dst="decoder_texture_Y_IAP" dst-port="AC_PRED_DIR"
  src="decoder_texture_Y_DCRecontruction_invpred" src-port="AC_PRED_DIR"/>
<Connection dst="decoder_texture_Y_IS" dst-port="AC_PRED_DIR"
  src="decoder_texture_Y_DCRecontruction_invpred" src-port="AC_PRED_DIR"/>
<Connection dst="decoder_texture_Y_idct2d" dst-port="SIGNED"
  src="decoder_texture_Y_DCRecontruction_invpred" src-port="SIGNED"/>
<Connection dst="decoder_texture_Y_IAP" dst-port="QP"
  src="decoder_texture_Y_DCRecontruction_invpred" src-port="QUANT"/>
<Connection dst="decoder_texture_Y_IAP" dst-port="PREV_QP"
  src="decoder_texture_Y_DCRecontruction_invpred" src-port="PREV_QUANT"/>
<Connection dst="decoder_texture_Y_DCRecontruction_invpred"
  dst-port="QFS_DC" src="decoder_texture_Y_DCsplit" src-port="DC"/>
<Connection dst="decoder_texture_Y_DCsplit" dst-port="IN"
  src="decoder_parser_splitter_420_B" src-port="B_Y"/>
<Connection dst="decoder_texture_Y_DCRecontruction_invpred"
  dst-port="QP" src="decoder_parser_splitter_BTYPE" src-port="QP_Y"/>
<Connection dst="decoder_texture_Y_DCRecontruction_addressing"
  dst-port="WIDTH" src="decoder_parser_parseheaders" src-port="WIDTH"/>
<Connection dst="decoder_texture_Y_DCRecontruction_invpred"
  dst-port="WIDTH" src="decoder_parser_parseheaders" src-port="WIDTH"/>
<Connection dst="decoder_texture_Y_DCRecontruction_invpred"
```

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```
  dst-port="AC_CODED" src="decoder_parser_splitter_BTYPE" src-port="ACCODED_Y"/>
<Connection dst="decoder_texture_Y_DCRecontruction_invpred"
  dst-port="AC_PRED" src="decoder_parser_splitter_BTYPE" src-port="ACPRED_Y"/>
<Connection dst="decoder_texture_Y_DCRecontruction_addressing"
  dst-port="BTYPE" src="decoder_parser_splitter_BTYPE" src-port="BTYPE_Y"/>
<Connection dst="decoder_texture_Y_DCRecontruction_invpred"
  dst-port="BTYPE" src="decoder_parser_splitter_BTYPE" src-port="BTYPE_Y"/>
<Connection dst="decoder_texture_U_IS" dst-port="QFS_AC"
  src="decoder_texture_U_DCsplit" src-port="AC"/>
<Connection dst="decoder_texture_U_IAP" dst-port="PQF_AC"
  src="decoder_texture_U_IS" src-port="PQF_AC"/>
<Connection dst="decoder_texture_U_IQ" dst-port="AC"
  src="decoder_texture_U_IAP" src-port="QF_AC"/>
<Connection dst="decoder_texture_U_idct2d" dst-port="IN"
  src="decoder_texture_U_IQ" src-port="OUT"/>
<Connection dst="decoder_texture_U_DCRecontruction_invpred"
  dst-port="A" src="decoder_texture_U_DCRecontruction_addressing" src-port="A"/>
<Connection dst="decoder_texture_U_DCRecontruction_invpred"
  dst-port="B" src="decoder_texture_U_DCRecontruction_addressing" src-port="B"/>
<Connection dst="decoder_texture_U_DCRecontruction_invpred"
  dst-port="C" src="decoder_texture_U_DCRecontruction_addressing" src-port="C"/>
<Connection dst="decoder_texture_U_idct2d" dst-port="SIGNED"
  src="decoder_texture_U_DCRecontruction_invpred" src-port="SIGNED"/>
<Connection dst="decoder_texture_U_IQ" dst-port="QP"
  src="decoder_texture_U_DCRecontruction_invpred" src-port="QUANT"/>
<Connection dst="decoder_texture_U_IQ" dst-port="DC"
  src="decoder_texture_U_DCRecontruction_invpred" src-port="QF_DC"/>
<Connection dst="decoder_texture_U_IAP" dst-port="PTR"
  src="decoder_texture_U_DCRecontruction_invpred" src-port="PTR"/>
<Connection dst="decoder_texture_U_IAP" dst-port="AC_PRED_DIR"
  src="decoder_texture_U_DCRecontruction_invpred" src-port="AC_PRED_DIR"/>
<Connection dst="decoder_texture_U_IS" dst-port="AC_PRED_DIR"
  src="decoder_texture_U_DCRecontruction_invpred" src-port="AC_PRED_DIR"/>
<Connection dst="decoder_texture_U_IAP" dst-port="QP"
  src="decoder_texture_U_DCRecontruction_invpred" src-port="QUANT"/>
<Connection dst="decoder_texture_U_IAP" dst-port="PREV_QP"
  src="decoder_texture_U_DCRecontruction_invpred" src-port="PREV_QUANT"/>
<Connection dst="decoder_texture_U_DCRecontruction_invpred"
  dst-port="QFS_DC" src="decoder_texture_U_DCsplit" src-port="DC"/>
<Connection dst="decoder_texture_U_DCsplit" dst-port="IN"
  src="decoder_parser_splitter_420_B" src-port="B_U"/>
<Connection dst="decoder_texture_U_DCRecontruction_invpred"
  dst-port="QP" src="decoder_parser_splitter_BTYPE" src-port="QP_U"/>
<Connection dst="decoder_texture_U_DCRecontruction_addressing"
  dst-port="WIDTH" src="decoder_parser_parseheaders" src-port="WIDTH"/>
<Connection dst="decoder_texture_U_DCRecontruction_invpred"
  dst-port="WIDTH" src="decoder_parser_parseheaders" src-port="WIDTH"/>
<Connection dst="decoder_texture_U_DCRecontruction_invpred"
  dst-port="AC_CODED" src="decoder_parser_splitter_BTYPE" src-port="ACCODED_U"/>
<Connection dst="decoder_texture_U_DCRecontruction_invpred"
  dst-port="AC_PRED" src="decoder_parser_splitter_BTYPE" src-port="ACPRED_U"/>
<Connection dst="decoder_texture_U_DCRecontruction_addressing"
  dst-port="BTYPE" src="decoder_parser_splitter_BTYPE" src-port="BTYPE_U"/>
<Connection dst="decoder_texture_U_DCRecontruction_invpred"
  dst-port="BTYPE" src="decoder_parser_splitter_BTYPE" src-port="BTYPE_U"/>
<Connection dst="decoder_texture_V_IS" dst-port="QFS_AC"
  src="decoder_texture_V_DCsplit" src-port="AC"/>
<Connection dst="decoder_texture_V_IAP" dst-port="PQF_AC"
  src="decoder_texture_V_IS" src-port="PQF_AC"/>
<Connection dst="decoder_texture_V_IQ" dst-port="AC"
  src="decoder_texture_V_IAP" src-port="QF_AC"/>
<Connection dst="decoder_texture_V_idct2d" dst-port="IN"
  src="decoder_texture_V_IQ" src-port="OUT"/>
<Connection dst="decoder_texture_V_DCRecontruction_invpred"
  dst-port="A" src="decoder_texture_V_DCRecontruction_addressing" src-port="A"/>
<Connection dst="decoder_texture_V_DCRecontruction_invpred"
  dst-port="B" src="decoder_texture_V_DCRecontruction_addressing" src-port="B"/>
<Connection dst="decoder_texture_V_DCRecontruction_invpred"
  dst-port="C" src="decoder_texture_V_DCRecontruction_addressing" src-port="C"/>
<Connection dst="decoder_texture_V_idct2d" dst-port="SIGNED"
  src="decoder_texture_V_DCRecontruction_invpred" src-port="SIGNED"/>
<Connection dst="decoder_texture_V_IQ" dst-port="QP"
  src="decoder_texture_V_DCRecontruction_invpred" src-port="QUANT"/>
<Connection dst="decoder_texture_V_IQ" dst-port="DC"
  src="decoder_texture_V_DCRecontruction_invpred" src-port="QF_DC"/>
<Connection dst="decoder_texture_V_IAP" dst-port="PTR"
  src="decoder_texture_V_DCRecontruction_invpred" src-port="PTR"/>
<Connection dst="decoder_texture_V_IAP" dst-port="AC_PRED_DIR"
  src="decoder_texture_V_DCRecontruction_invpred" src-port="AC_PRED_DIR"/>
<Connection dst="decoder_texture_V_IS" dst-port="AC_PRED_DIR"
  src="decoder_texture_V_DCRecontruction_invpred" src-port="AC_PRED_DIR"/>
<Connection dst="decoder_texture_V_IAP" dst-port="QP"
  src="decoder_texture_V_DCRecontruction_invpred" src-port="QUANT"/>
<Connection dst="decoder_texture_V_IAP" dst-port="PREV_QP"
  src="decoder_texture_V_DCRecontruction_invpred" src-port="PREV_QUANT"/>
<Connection dst="decoder_texture_V_DCRecontruction_invpred"
```

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```
  dst-port="QFS_DC" src="decoder_texture_V_DCsplit" src-port="DC"/>
<Connection dst="decoder_texture_V_DCsplit" dst-port="IN"
  src="decoder_parser_splitter_420_B" src-port="B_V"/>
<Connection dst="decoder_texture_V_DCRecontruction_invpred"
  dst-port="QP" src="decoder_parser_splitter_BTYPE" src-port="QP_V"/>
<Connection dst="decoder_texture_V_DCRecontruction_addressing"
  dst-port="WIDTH" src="decoder_parser_parseheaders" src-port="WIDTH"/>
<Connection dst="decoder_texture_V_DCRecontruction_invpred"
  dst-port="WIDTH" src="decoder_parser_parseheaders" src-port="WIDTH"/>
<Connection dst="decoder_texture_V_DCRecontruction_invpred"
  dst-port="AC_CODED" src="decoder_parser_splitter_BTYPE" src-port="ACCODED_V"/>
<Connection dst="decoder_texture_V_DCRecontruction_invpred"
  dst-port="AC_PRED" src="decoder_parser_splitter_BTYPE" src-port="ACPRED_V"/>
<Connection dst="decoder_texture_V_DCRecontruction_addressing"
  dst-port="BTYPE" src="decoder_parser_splitter_BTYPE" src-port="BTYPE_V"/>
<Connection dst="decoder_texture_V_DCRecontruction_invpred"
  dst-port="BTYPE" src="decoder_parser_splitter_BTYPE" src-port="BTYPE_V"/>
<Connection dst="decoder_motion_Y_add" dst-port="MOT"
  src="decoder_motion_Y_interpolation" src-port="MOT"/>
<Connection dst="decoder_motion_Y_interpolation" dst-port="RD"
  src="decoder_motion_Y_FrameBuff" src-port="RD"/>
<Connection dst="decoder_motion_Y_interpolation" dst-port="halfpel"
  src="decoder_motion_Y_FrameBuff" src-port="halfpel"/>
<Connection dst="decoder_motion_Y_FrameBuff" dst-port="WD"
  src="decoder_motion_Y_add" src-port="VID"/>
<Connection dst="decoder_Merger420" dst-port="Y"
  src="decoder_motion_Y_add" src-port="VID"/>
<Connection dst="decoder_motion_Y_FrameBuff" dst-port="MV"
  src="decoder_parser_splitter_MV" src-port="MV_Y"/>
<Connection dst="decoder_motion_Y_FrameBuff" dst-port="WIDTH"
  src="decoder_parser_parseheaders" src-port="WIDTH"/>
<Connection dst="decoder_motion_Y_FrameBuff" dst-port="HEIGHT"
  src="decoder_parser_parseheaders" src-port="HEIGHT"/>
<Connection dst="decoder_motion_Y_FrameBuff" dst-port="ROUND"
  src="decoder_parser_parseheaders" src-port="ROUND"/>
<Connection dst="decoder_motion_Y_add" dst-port="ACCODED"
  src="decoder_parser_splitter_BTYPE" src-port="ACCODED_Y"/>
<Connection dst="decoder_motion_Y_FrameBuff" dst-port="MOT"
  src="decoder_parser_splitter_BTYPE" src-port="MOTION_Y"/>
<Connection dst="decoder_motion_Y_add" dst-port="BTYPE"
  src="decoder_parser_splitter_BTYPE" src-port="BTYPE_Y"/>
<Connection dst="decoder_motion_Y_FrameBuff" dst-port="BTYPE"
  src="decoder_parser_splitter_BTYPE" src-port="BTYPE_Y"/>
<Connection dst="decoder_motion_Y_add" dst-port="TEX"
  src="decoder_texture_Y_idct2d" src-port="OUT"/>
<Connection dst="decoder_motion_U_add" dst-port="MOT"
  src="decoder_motion_U_interpolation" src-port="MOT"/>
<Connection dst="decoder_motion_U_interpolation" dst-port="RD"
  src="decoder_motion_U_FrameBuff" src-port="RD"/>
<Connection dst="decoder_motion_U_interpolation" dst-port="halfpel"
  src="decoder_motion_U_FrameBuff" src-port="halfpel"/>
<Connection dst="decoder_motion_U_FrameBuff" dst-port="WD"
  src="decoder_motion_U_add" src-port="VID"/>
<Connection dst="decoder_Merger420" dst-port="U"
  src="decoder_motion_U_add" src-port="VID"/>
<Connection dst="decoder_motion_U_FrameBuff" dst-port="MV"
  src="decoder_parser_splitter_MV" src-port="MV_U"/>
<Connection dst="decoder_motion_U_FrameBuff" dst-port="HEIGHT"
  src="decoder_parser_parseheaders" src-port="HEIGHT"/>
<Connection dst="decoder_motion_U_FrameBuff" dst-port="WIDTH"
  src="decoder_parser_parseheaders" src-port="WIDTH"/>
<Connection dst="decoder_motion_U_FrameBuff" dst-port="ROUND"
  src="decoder_parser_parseheaders" src-port="ROUND"/>
<Connection dst="decoder_motion_U_add" dst-port="ACCODED"
  src="decoder_parser_splitter_BTYPE" src-port="ACCODED_U"/>
<Connection dst="decoder_motion_U_FrameBuff" dst-port="MOT"
  src="decoder_parser_splitter_BTYPE" src-port="MOTION_U"/>
<Connection dst="decoder_motion_U_add" dst-port="BTYPE"
  src="decoder_parser_splitter_BTYPE" src-port="BTYPE_U"/>
<Connection dst="decoder_motion_U_FrameBuff" dst-port="BTYPE"
  src="decoder_parser_splitter_BTYPE" src-port="BTYPE_U"/>
<Connection dst="decoder_motion_U_add" dst-port="TEX"
  src="decoder_texture_U_idct2d" src-port="OUT"/>
<Connection dst="decoder_motion_V_add" dst-port="MOT"
  src="decoder_motion_V_interpolation" src-port="MOT"/>
<Connection dst="decoder_motion_V_interpolation" dst-port="RD"
  src="decoder_motion_V_FrameBuff" src-port="RD"/>
<Connection dst="decoder_motion_V_interpolation" dst-port="halfpel"
  src="decoder_motion_V_FrameBuff" src-port="halfpel"/>
<Connection dst="decoder_motion_V_FrameBuff" dst-port="WD"
  src="decoder_motion_V_add" src-port="VID"/>
<Connection dst="decoder_Merger420" dst-port="V"
  src="decoder_motion_V_add" src-port="VID"/>
<Connection dst="decoder_motion_V_FrameBuff" dst-port="MV"
  src="decoder_parser_splitter_MV" src-port="MV_V"/>
<Connection dst="decoder_motion_V_FrameBuff" dst-port="WIDTH"
```

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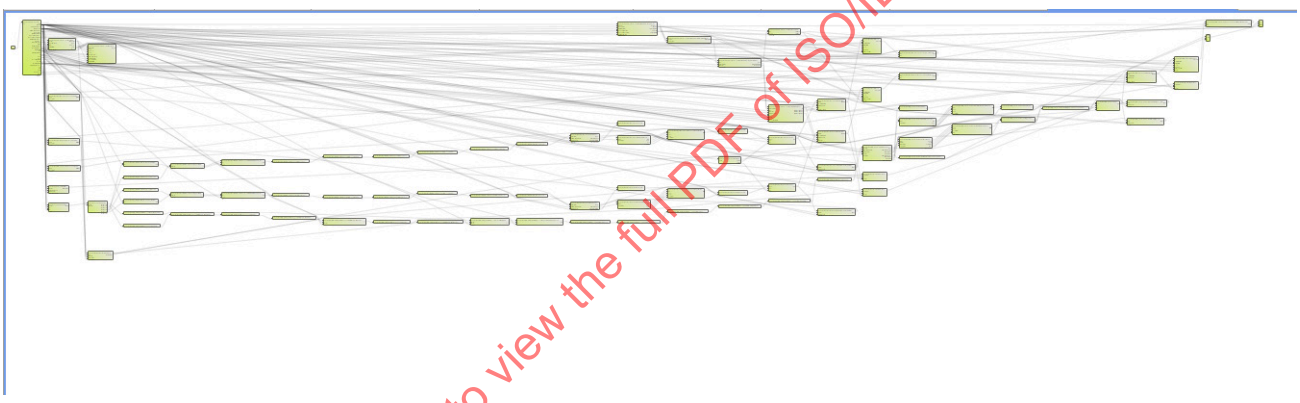
```
    src="decoder_parser_parseheaders" src-port="WIDTH"/>
  <Connection dst="decoder_motion_V_FrameBuff" dst-port="HEIGHT"
    src="decoder_parser_parseheaders" src-port="HEIGHT"/>
  <Connection dst="decoder_motion_V_FrameBuff" dst-port="ROUND"
    src="decoder_parser_parseheaders" src-port="ROUND"/>
  <Connection dst="decoder_motion_V_add" dst-port="ACCODED"
    src="decoder_parser_splitter_BTYPE" src-port="ACCODED_V"/>
  <Connection dst="decoder_motion_V_FrameBuff" dst-port="MOT"
    src="decoder_parser_splitter_BTYPE" src-port="MOTION_V"/>
  <Connection dst="decoder_motion_V_add" dst-port="BTYPE"
    src="decoder_parser_splitter_BTYPE" src-port="BTYPE_V"/>
  <Connection dst="decoder_motion_V_FrameBuff" dst-port="BTYPE"
    src="decoder_parser_splitter_BTYPE" src-port="BTYPE_V"/>
  <Connection dst="decoder_motion_V_add" dst-port="TEX"
    src="decoder_texture_V_idct2d" src-port="OUT"/>
  <Connection dst="display" dst-port="B" src="decoder_Merger420" src-port="YUV"/>
  <Connection dst="display" dst-port="WIDTH"
    src="decoder_parser_parseheaders" src-port="WIDTH"/>
  <Connection dst="display" dst-port="HEIGHT"
    src="decoder_parser_parseheaders" src-port="HEIGHT"/>
  <Connection dst="decoder_serialize" dst-port="BYTE" src="source" src-port="O"/>
</XDF>
```

B.3 FNL of MPEG-4 AVC Constrained Baseline Profile decoder



Complete example of the MPEG-4 AVC Constrained Baseline Profile decoder (refer to Top_mpeg4_part10_CBP_decoder.xdf file).

```
<?xml version="1.0" encoding="UTF-8"?>
<XDF name="Top_mpeg4_part10_CBP_decoder">
  <Instance id="source">
    <Class name="org.sc29.wg11.stdio.Source"/>
  </Instance>
  <Instance id="Merger">
    <Class name="std.image.format.Merger420"/>
  </Instance>
  <Instance id="display">
    <Class name="org.sc29.wg11.video.DisplayYUV"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Algo_Synp">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.synParser.Algo_SynP"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Algo_Parser_IPCM">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.synParser.Algo_Parser_IPCM"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_IntraPredSplit">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.synParser.Algo_IntraPred_Split"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO">
```

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```
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_MMCO"/>
</Instance>
<Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_RefList"/>
</Instance>
<Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_Mgnt_InterPred">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Mgnt_InterPred"/>
</Instance>
<Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.deblockingFilter.Mgnt_DBF_AdaptiveFilter "/>
</Instance>
<Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_MvLXReconstr"/>
  <Parameter name="IsPredL0">
    <Expr kind="Literal" literal-kind="Boolean" value="true"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.RefIdxtoFrameNum"/>
</Instance>
<Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.deblockingFilter.Algo_MvComponentReorder"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_DecodedPictureBuffer">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Mgnt_DPB"/>
  <Parameter name="MB_WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="16"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Select">
  <Class name="org.sc29.wg11.common.Algo_SelectMB_4"/>
  <Parameter name="WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="256"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.deblockingFilter.Algo_DBF_AdaptiveFilter "/>
  <Parameter name="ChromaEdgeFlag">
    <Expr kind="Literal" literal-kind="Boolean" value="false"/>
  </Parameter>
  <Parameter name="MbWidth">
    <Expr kind="Literal" literal-kind="Integer" value="16"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.selecMacroblock.Algo_DemuxParserInfoForBlocks_Luma"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Intra_16x16"/>
  <Parameter name="MB_WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="16"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_IntraPred_LUMA_16x16"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Add_Clip">
  <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Buffer_Neighbour_FullMb">
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Buffer_Neighbour_FullMb"/>
  <Parameter name="IsChroma">
    <Expr kind="Literal" literal-kind="Boolean" value="false"/>
  </Parameter>
  <Parameter name="MB_WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="16"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Intra_4x4"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_IntraPred_LUMA_4x4"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Add_4x4">
  <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Merge_4x4_to_16x16_norasterscan">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_Merge_4x4_to_16x16_norasterscan"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Split_16x16_to_4x4_norasterscan">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_Split_16x16_to_4x4_norasterscan"/>
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<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Buffer_Neighbour_4x4">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Buffer_Neighbour_YxY"/>
  <Parameter name="IsIntra4x4">
    <Expr kind="Literal" literal-kind="Boolean" value="true"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_SeparableSixTapQuarterPel">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_Interp_SeparableSixTapQuarterPel"/>
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  <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_Interp_Reord"/>
  <Parameter name="SzSidePerPart">
    <Expr kind="Literal" literal-kind="Integer" value="4"/>
  </Parameter>
</Instance>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Merge_4x4_to_16x16"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_IS_Zigzag_4x4_DC">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IS_Zigzag_4x4"/>
</Instance>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_LUMA_IHT1d"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_0">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_IHT1d_1">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_LUMA_IHT1d"/>
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<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Scaling">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_LUMA_Scaling"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_1">
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
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</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IS_Zigzag_4x4_AC">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IS_Zigzag_4x4"/>
</Instance>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Mgnt_IQ_INTRA16x16"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IQ_QSAndSLAndIDCTScaler_4x4">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IQ_QSAndSLAndIDCTScaler_4x4"/>
  <Parameter name="NB4x4">
    <Expr kind="Literal" literal-kind="Integer" value="16"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_1d_0">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_1d"/>
</Instance>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
</Instance>
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</Instance>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_Addshift"/>
</Instance>
<Instance id="AVCDecoder_Decode_U_Buffer_inter">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Mgnt_DPB"/>
  <Parameter name="MB_WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="8"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decode_U_PredictionC_Select_chroma">
  <Class name="org.sc29.wg11.common.Algo_SelectMB_4"/>
  <Parameter name="WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="64"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decode_U_PredictionC_Deblocking_Filter">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.deblockingFilter.Algo_DBF_AdaptiveFilter "/>
  <Parameter name="ChromaEdgeFlag">
    <Expr kind="Literal" literal-kind="Boolean" value="true"/>
  </Parameter>
  <Parameter name="MbWidth">
    <Expr kind="Literal" literal-kind="Integer" value="8"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decode_U_PredictionC_DemuxParserInfos">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.selecMacroblock.Algo_DemuxParserInfoForBlocks_Chroma"/>
</Instance>
<Instance id="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_IntraPred_CHROMA">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_IntraPred_CHROMA"/>
</Instance>
<Instance id="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_Add">
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  <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
</Instance>
<Instance id="AVCDecoder_Decode_U_PredictionC_Intra8x8_Buffer_Neighbour_FullMb">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Buffer_Neighbour_FullMb"/>
  <Parameter name="IsChroma">
    <Expr kind="Literal" literal-kind="Boolean" value="true"/>
  </Parameter>
  <Parameter name="MB_WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="8"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decode_U_PredictionC_Intra8x8_Mgnt_Intra_8x8">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Intra_16x16"/>
  <Parameter name="MB_WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="8"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_EighthPelBilinear">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_Interp_Bilinear"/>
</Instance>
<Instance id="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Add">
  <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
</Instance>
<Instance id="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_Reord">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_Interp_Reord"/>
  <Parameter name="SzSidePerPart">
    <Expr kind="Literal" literal-kind="Integer" value="2"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decode_U_ResidualC_Algo_DCR_Hadamard_CHROMA">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_CHROMA"/>
</Instance>
<Instance id="AVCDecoder_Decode_U_ResidualC_Algo_Merge_4x4_to_8x8">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Merge_4x4_to_8x8"/>
</Instance>
<Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Algo_IS_Zigzag_4x4">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IS_Zigzag_4x4"/>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Mgnt_IQ_Chroma"/>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IQ_QSAndSLAndIDCTScaler_4x4"/>
  <Parameter name="NB4x4">
    <Expr kind="Literal" literal-kind="Integer" value="4"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_0">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_1d"/>
</Instance>
<Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_0">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
</Instance>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_1d"/>
</Instance>
<Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_1">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
</Instance>
<Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_Addshift">
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_Addshift"/>
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<Instance id="AVCDecoder_Decode_V_Buffer_inter">
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  <Class name="org.sc29.wg11.common.Algo_SelectMB_4"/>
  <Parameter name="WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="64"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decode_V_PredictionC_Deblocking_Filter">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.deblockingFilter.Algo_DBF_AdaptiveFilter "/>
  <Parameter name="ChromaEdgeFlag">
    <Expr kind="Literal" literal-kind="Boolean" value="true"/>
  </Parameter>
  <Parameter name="MbWidth">
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_IntraPred_CHROMA"/>
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  <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Buffer_Neighbour_FullMb"/>
  <Parameter name="IsChroma">
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  <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
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</Instance>
<Instance id="AVCDecoder_Decode_V_ResidualC_Algo_DCR_Hadamard_CHROMA">
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_CHROMA"/>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Merge_4x4_to_8x8"/>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IS_Zigzag_4x4"/>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Mgnt_IQ_Chroma"/>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IQ_QSAndSLAndIDCTScaler_4x4"/>
  <Parameter name="NB4x4">
    <Expr kind="Literal" literal-kind="Integer" value="4"/>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.synParser.Algo_BlockSplit"/>
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<Instance id="AVCDecoder_Display_Render_DisplayRendererU">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.display.Mgnt_BufferRenderer"/>
  <Parameter name="MB_WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="8"/>
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</Instance>
<Instance id="AVCDecoder_Display_Render_DisplayRendererV">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.display.Mgnt_BufferRenderer"/>
  <Parameter name="MB_WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="8"/>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.display.Mgnt_POC"/>
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  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
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  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="CONSTRAINED_IFLAG"/>
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  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="EMPTY_DPB"/>
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  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="ST_LIST"/>
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  dst-port="ST_LIST_SZ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="ST_LIST_SZ"/>
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  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="LT_LIST"/>
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  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum"
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  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="REF_IDX_OUT"/>
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  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
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  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="MV_OUT"/>
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  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum" src-port="READ_FRAME"/>
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  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="IS_NEW_MB_SLICE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_Mgnt_InterPred"
  dst-port="MV"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="MV_OUT"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_Mgnt_InterPred"
  dst-port="PARTSZ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord" src-port="PARTSZ"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_Mgnt_InterPred"
  dst-port="LOCATION"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="LOCATION"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="READ_FRAME"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord" src-port="READ_FRAME_DBF"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="MV"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord" src-port="MV_OUT_DBF"/>
<Connection
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  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum"
  dst-port="REF_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0" src-port="REF_LIST"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="SUB_MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
  dst-port="SUB_MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="MB_PRED_MVD" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_PRED_MVD_l0"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="SUB_MB_PRED_MVD" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_PRED_MVD_l0"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="SUB_MB_PRED_REF_IDX"
  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_PRED_REF_IDX_l0"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="MB_PRED_REF_IDX" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_PRED_REF_IDX_l0"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
  dst-port="REF_TYPE_LIST" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="REF_TYPE_l0"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
  dst-port="MAX_FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MAX_FRAME_NUM"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
  dst-port="MAX_FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MAX_FRAME_NUM"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
  dst-port="MMCO" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MMCO"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
  dst-port="NB_REF_FRAME" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="NB_REF_FRAME_l0"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
  dst-port="REF_REORDERING" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="REF_REORDERING"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
  dst-port="FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="FRAME_NUM"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
  dst-port="FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="FRAME_NUM"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
  dst-port="POC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="POC"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
  dst-port="POC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="POC"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
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  dst-port="NUM_REF_FRAME" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="NUM_REF_FRAMES"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="QP_Y" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="QP_Cb" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP_Cb"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="QP_Cr" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP_Cr"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="SLICE_DBF_PARAM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SLICE_DBF_PARAM"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="CBP_BLK" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="CBP_BLK"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter"
  dst-port="MB_IN" src="AVCDecoder_Decoding_Y_PredictionY_Select" src-port="OUT"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Select"
  dst-port="SELECT"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="SELECT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Add_Clip"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16" src-port="MPR"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16"
  dst-port="AVAIL"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16" src-port="AVAIL"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16"
  dst-port="Y_LEFT"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16" src-port="Y_LEFT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16"
  dst-port="Y_UP"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16" src-port="Y_UP"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16"
  dst-port="Y_UP_LEFT"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16" src-port="Y_UP_LEFT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16"
  dst-port="EDGE"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Buffer_Neighbour_FullMb" src-port="EDGE"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Select"
  dst-port="IN_2"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Add_Clip" src-port="Z"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Add_Clip"
  dst-port="Y"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="COEF_ACR_INTRA16"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16"
  dst-port="PRED_MODE"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="PRED_MODE16"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Buffer_Neighbour_FullMb"
  dst-port="MB_IN" src="AVCDecoder_Decoding_Y_PredictionY_Select" src-port="OUT"/>
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```
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16"
  dst-port="NEIGHBOUR"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="NEIGHBOUR16"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4"
  dst-port="Y_LEFT"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4" src-port="Y_LEFT4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4"
  dst-port="Y_UP"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4" src-port="Y_UP4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4"
  dst-port="Y_UP_LEFT"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4" src-port="Y_UP_LEFT4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Add_4x4"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4" src-port="MPR"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4"
  dst-port="AVAIL"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4" src-port="AVAIL"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Merge_4x4_to_16x16_norasterscan"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Add_4x4" src-port="Z"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Add_4x4"
  dst-port="Y"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Split_16x16_to_4x4_norasterscan" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4"
  dst-port="PRED_MODE"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4" src-port="PRED_MODE4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4"
  dst-port="EDGE"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Buffer_Neighbour_4x4" src-port="EDGE"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4"
  dst-port="MB_4X4"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Add_4x4" src-port="Z"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Select"
  dst-port="IN_1"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Merge_4x4_to_16x16_norasterscan" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Split_16x16_to_4x4_norasterscan"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="COEF_ACR_INTRA4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4"
  dst-port="PRED_MODE"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="PRED_MODE4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Buffer_Neighbour_4x4"
  dst-port="MB_IN" src="AVCDecoder_Decoding_Y_PredictionY_Select" src-port="OUT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4"
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```
  dst-port="NEIGHBOUR"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="NEIGHBOUR4"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Add_Clip"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_Reord" src-port="MBPRED"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_Reord"
  dst-port="INTERP"
  src="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_SeparableSixTapQuarterPel" src-port="INTERP"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Select"
  dst-port="IN_3"
  src="AVCDecoder_Decoding_Y_PredictionY_Inter_Add_Clip" src-port="Z"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Add_Clip"
  dst-port="Y"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="COEF_ACR_INTER"/>
<Connection dst="AVCDecoder_Decoding_Y_DecodedPictureBuffer"
  dst-port="WD"
  src="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter" src-port="MB_OUT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_SeparableSixTapQuarterPel"
  dst-port="RD" src="AVCDecoder_Decoding_Y_DecodedPictureBuffer" src-port="RD"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_IHT1d_0"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_IS_Zigzag_4x4_DC" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_0"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_IHT1d_0" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_IHT1d_1"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_0" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Scaling"
  dst-port="I"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_IHT1d_1" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_1"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Scaling" src-port="O"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Reordering"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_1" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Mgnt_IQ_INTRA16x16"
  dst-port="COEF_AC"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IS_Zigzag_4x4_AC" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
  dst-port="IN"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Mgnt_IQ_INTRA16x16" src-port="O"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
  dst-port="IS_DC"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Mgnt_IQ_INTRA16x16" src-port="IS_DC"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_Transpose4x4_0"
  dst-port="X"
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  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_1d_0" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_1d_1"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_Transpose4x4_0" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_Transpose4x4_1"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_1d_1" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_Addshift"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_Transpose4x4_1" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_1d_0"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IQ_QSAndSLAndIDCTScaler_4x4" src-port="OUT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_Algo_Merge_4x4_to_16x16"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_Addshift" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Mgnt_IQ_INTRA16x16"
  dst-port="COEF_DC"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Reordering" src-port="Y"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos"
  dst-port="COEF_ACR"
  src="AVCDecoder_Decoding_Y_ResidualY_Algo_Merge_4x4_to_16x16" src-port="Y"/>
<Connection dst="AVCDecoder_Decoding_Y_DecodedPictureBuffer"
  dst-port="PIC_SIZE_IN_MB" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="PIC_SIZE_IN_MB"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter"
  dst-port="PIC_SIZE_IN_MB" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="PIC_SIZE_IN_MB"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos"
  dst-port="CONSTRAINED_IFLAG"
  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="CONSTRAINED_IFLAG"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_Reord"
  dst-port="SUB_MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_TYPE"/>
<Connection dst="AVCDecoder_Decoding_Y_DecodedPictureBuffer"
  dst-port="FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="FRAME_NUM"/>
<Connection dst="AVCDecoder_Decoding_Y_DecodedPictureBuffer"
  dst-port="DEL_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="DEL_LIST"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_SeparableSixTapQuarterPel"
  dst-port="MV"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="MV_OUT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_SeparableSixTapQuarterPel"
  dst-port="PARTSZ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord" src-port="PARTSZ"/>
<Connection dst="AVCDecoder_Decoding_Y_DecodedPictureBuffer"
  dst-port="ENABLE_READ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="IS_NEW_MB_PIC"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Select"
  dst-port="IN_0" src="AVCDecoder_Syn_Parser_Algo_Parser_IPCM" src-port="I_PCM_Y"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection
```

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```
  dst="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Buffer_Neighbour_FullMb"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Buffer_Neighbour_4x4"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection dst="AVCDecoder_Decoding_Y_DecodedPictureBuffer"
  dst-port="FRAME_TO_READ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum" src-port="READ_FRAME"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter"
  dst-port="BS"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter" src-port="BS"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter"
  dst-port="MB_DBF_PARAM"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter" src-port="MB_DBF_PARAM_Y"/>
<Connection dst="AVCDecoder_Decoding_Y_DecodedPictureBuffer"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Buffer_Neighbour_FullMb"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Buffer_Neighbour_4x4"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_Reord"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Scaling"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Mgnt_IQ_INTRA16x16"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Scaling"
  dst-port="QP" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
  dst-port="QP" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP"/>
<Connection dst="AVCDecoder_Decoding_Y_DecodedPictureBuffer"
  dst-port="RA"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_Mgnt_InterPred" src-port="R_ADDR_L"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos"
  dst-port="PRED_MODE" src="AVCDecoder_Syn_Parser_IntraPredSplit" src-port="PRED_MODE"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Deblocking_Filter"
  dst-port="MB_IN"
  src="AVCDecoder_Decode_U_PredictionC_Select_chroma" src-port="OUT"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Select_chroma"
  dst-port="SELECT"
  src="AVCDecoder_Decode_U_PredictionC_DemuxParserInfos" src-port="SELECT"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Mgnt_Intra_8x8"
```

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```
  dst-port="EDGE"
  src="AVCDecoder_Decode_U_PredictionC_Intra8x8_Buffer_Neighbour_FullMb" src-port="EDGE"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_IntraPred_CHROMA"
  dst-port="AVAIL"
  src="AVCDecoder_Decode_U_PredictionC_Intra8x8_Mgnt_Intra_8x8" src-port="AVAIL"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_IntraPred_CHROMA"
  dst-port="C_LEFT"
  src="AVCDecoder_Decode_U_PredictionC_Intra8x8_Mgnt_Intra_8x8" src-port="Y_LEFT"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_IntraPred_CHROMA"
  dst-port="C_UP"
  src="AVCDecoder_Decode_U_PredictionC_Intra8x8_Mgnt_Intra_8x8" src-port="Y_UP"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_IntraPred_CHROMA"
  dst-port="C_UP_LEFT"
  src="AVCDecoder_Decode_U_PredictionC_Intra8x8_Mgnt_Intra_8x8" src-port="Y_UP_LEFT"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_Add"
  dst-port="X"
  src="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_IntraPred_CHROMA" src-port="MPR"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Select_chroma"
  dst-port="IN_1"
  src="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_Add" src-port="Z"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_Add"
  dst-port="Y"
  src="AVCDecoder_Decode_U_PredictionC_DemuxParserInfos" src-port="COEF_ACR_INTRA"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Buffer_Neighbour_FullMb"
  dst-port="MB_IN"
  src="AVCDecoder_Decode_U_PredictionC_Select_chroma" src-port="OUT"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Mgnt_Intra_8x8"
  dst-port="NEIGHBOUR"
  src="AVCDecoder_Decode_U_PredictionC_DemuxParserInfos" src-port="NEIGHBOUR_INTRA"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Add"
  dst-port="X"
  src="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_Reord" src-port="MBPRED"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_Reord"
  dst-port="INTERP"
  src="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_EighthPelBilinear" src-port="INTERP"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Select_chroma"
  dst-port="IN_2"
  src="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Add" src-port="Z"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Add"
  dst-port="Y"
  src="AVCDecoder_Decode_U_PredictionC_DemuxParserInfos" src-port="COEF_ACR_INTER"/>
<Connection dst="AVCDecoder_Decode_U_Buffer_inter" dst-port="WD"
  src="AVCDecoder_Decode_U_PredictionC_Deblocking_Filter" src-port="MB_OUT"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_EighthPelBilinear"
  dst-port="RD" src="AVCDecoder_Decode_U_Buffer_inter" src-port="RD"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Mgnt_IQ_Chroma"
  dst-port="COEF_AC"
  src="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Algo_IS_Zigzag_4x4" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
  dst-port="IN"
```

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```
  src="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Mgnt_IQ_Chroma" src-port="O"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
  dst-port="IS_DC"
  src="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Mgnt_IQ_Chroma" src-port="IS_DC"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_0"
  dst-port="X"
  src="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_0" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_1"
  dst-port="X"
  src="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_0" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_1"
  dst-port="X"
  src="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_1" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_Addshift"
  dst-port="X"
  src="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_1" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_0"
  dst-port="X"
  src="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Algo_IQ_QSAndSLAndIDCTScaler_4x4" src-port="OUT"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_Algo_Merge_4x4_to_8x8"
  dst-port="X"
  src="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_Addshift" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Mgnt_IQ_Chroma"
  dst-port="COEF_DC"
  src="AVCDecoder_Decode_U_ResidualC_Algo_DCR_Hadamard_CHROMA" src-port="OUT"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_DemuxParserInfos"
  dst-port="COEF_ACR"
  src="AVCDecoder_Decode_U_ResidualC_Algo_Merge_4x4_to_8x8" src-port="Y"/>
<Connection dst="AVCDecoder_Decode_U_Buffer_inter"
  dst-port="PIC_SIZE_IN_MB" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="PIC_SIZE_IN_MB"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Deblocking_Filter"
  dst-port="PIC_SIZE_IN_MB" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="PIC_SIZE_IN_MB"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_IntraPred_CHROMA"
  dst-port="PredMode" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="INTRA_PRED_MODEC"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_DemuxParserInfos"
  dst-port="CONSTRAINED_IFLAG"
  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="CONSTRAINED_IFLAG"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_Reord"
  dst-port="SUB_MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_TYPE"/>
<Connection dst="AVCDecoder_Decode_U_Buffer_inter"
  dst-port="FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="FRAME_NUM"/>
<Connection dst="AVCDecoder_Decode_U_Buffer_inter"
  dst-port="DEL_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="DEL_LIST"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_EighthPelBilinear"
  dst-port="MV"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="MV_OUT"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_EighthPelBilinear"
```

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```
  dst-port="PARTSZ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord" src-port="PARTSZ"/>
<Connection dst="AVCDecoder_Decode_U_Buffer_inter" dst-port="RA"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_Mgnt_InterPred" src-port="R_ADDR_C"/>
<Connection dst="AVCDecoder_Decode_U_Buffer_inter"
  dst-port="ENABLE_READ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="IS_NEW_MB_PIC"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Select_chroma"
  dst-port="IN_0" src="AVCDecoder_Syn_Parser_Algo_Parser_IPCM" src-port="I_PCM_U"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_DemuxParserInfos"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Deblocking_Filter"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Buffer_Neighbour_FullMb"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection dst="AVCDecoder_Decode_U_Buffer_inter"
  dst-port="FRAME_TO_READ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum" src-port="READ_FRAME"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Deblocking_Filter"
  dst-port="BS"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter" src-port="BS"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Deblocking_Filter"
  dst-port="MB_DBF_PARAM"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter" src-port="MB_DBF_PARAM_U"/>
<Connection dst="AVCDecoder_Decode_U_Buffer_inter"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_Deblocking_Filter"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection dst="AVCDecoder_Decode_U_PredictionC_DemuxParserInfos"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Intra8x8_Buffer_Neighbour_FullMb"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_Reord"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_Algo_DCR_Hadamard_CHROMA"
  dst-port="QP" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP_Cb"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
  dst-port="QP" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP_Cb"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Deblocking_Filter"
  dst-port="MB_IN"
  src="AVCDecoder_Decode_V_PredictionC_Select_chroma" src-port="OUT"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Select_chroma"
  dst-port="SELECT"
  src="AVCDecoder_Decode_V_PredictionC_DemuxParserInfos" src-port="SELECT"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Mgnt_Intra_8x8"
  dst-port="EDGE"
  src="AVCDecoder_Decode_V_PredictionC_Intra8x8_Buffer_Neighbour_FullMb" src-port="EDGE"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Algo_IntraPred_CHROMA"
  dst-port="AVAIL"
  src="AVCDecoder_Decode_V_PredictionC_Intra8x8_Mgnt_Intra_8x8" src-port="AVAIL"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Algo_IntraPred_CHROMA"
  dst-port="C_LEFT"
```

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```
  src="AVCDecoder_Decode_V_PredictionC_Intra8x8_Mgnt_Intra_8x8" src-port="Y_LEFT"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Algo_IntraPred_CHROMA"
  dst-port="C_UP"
  src="AVCDecoder_Decode_V_PredictionC_Intra8x8_Mgnt_Intra_8x8" src-port="Y_UP"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Algo_IntraPred_CHROMA"
  dst-port="C_UP_LEFT"
  src="AVCDecoder_Decode_V_PredictionC_Intra8x8_Mgnt_Intra_8x8" src-port="Y_UP_LEFT"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Algo_Add"
  dst-port="X"
  src="AVCDecoder_Decode_V_PredictionC_Intra8x8_Algo_IntraPred_CHROMA" src-port="MPR"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Select_chroma"
  dst-port="IN_1"
  src="AVCDecoder_Decode_V_PredictionC_Intra8x8_Algo_Add" src-port="Z"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Algo_Add"
  dst-port="Y"
  src="AVCDecoder_Decode_V_PredictionC_DemuxParserInfos" src-port="COEF_ACR_INTRA"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Buffer_Neighbour_FullMb"
  dst-port="MB_IN"
  src="AVCDecoder_Decode_V_PredictionC_Select_chroma" src-port="OUT"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Mgnt_Intra_8x8"
  dst-port="NEIGHBOUR"
  src="AVCDecoder_Decode_V_PredictionC_DemuxParserInfos" src-port="NEIGHBOUR_INTRA"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Add"
  dst-port="X"
  src="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Interp_Reord" src-port="MBPRED"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Interp_Reord"
  dst-port="INTERP"
  src="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Interp_EighthPelBilinear" src-port="INTERP"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Select_chroma"
  dst-port="IN_2"
  src="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Add" src-port="Z"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Add"
  dst-port="Y"
  src="AVCDecoder_Decode_V_PredictionC_DemuxParserInfos" src-port="COEF_ACR_INTER"/>
<Connection dst="AVCDecoder_Decode_V_Buffer_inter" dst-port="WD"
  src="AVCDecoder_Decode_V_PredictionC_Deblocking_Filter" src-port="MB_OUT"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Interp_EighthPelBilinear"
  dst-port="RD" src="AVCDecoder_Decode_V_Buffer_inter" src-port="RD"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_Mgnt_IQ_Chroma"
  dst-port="COEF_AC"
  src="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_Algo_IS_Zigzag_4x4" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
  dst-port="IN"
  src="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_Mgnt_IQ_Chroma" src-port="O"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
  dst-port="IS_DC"
  src="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_Mgnt_IQ_Chroma" src-port="IS_DC"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_0"
  dst-port="X"
  src="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_0" src-port="Y"/>
```

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```
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_1"
  dst-port="X"
  src="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_0" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_1"
  dst-port="X"
  src="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_1" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_Addshift"
  dst-port="X"
  src="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_1" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_0"
  dst-port="X"
  src="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_Algo_IQ_QSAndSLAndIDCTScaler_4x4" src-port="OUT"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_Algo_Merge_4x4_to_8x8"
  dst-port="X"
  src="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_Addshift" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_Mgnt_IQ_Chroma"
  dst-port="COEF_DC"
  src="AVCDecoder_Decode_V_ResidualC_Algo_DCR_Hadamard_CHROMA" src-port="OUT"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_DemuxParserInfos"
  dst-port="COEF_ACR"
  src="AVCDecoder_Decode_V_ResidualC_Algo_Merge_4x4_to_8x8" src-port="Y"/>
<Connection dst="AVCDecoder_Decode_V_Buffer_inter"
  dst-port="PIC_SIZE_IN_MB" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="PIC_SIZE_IN_MB"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Deblocking_Filter"
  dst-port="PIC_SIZE_IN_MB" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="PIC_SIZE_IN_MB"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Algo_IntraPred_CHROMA"
  dst-port="PredMode" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="INTRA_PRED_MODEC"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_DemuxParserInfos"
  dst-port="CONSTRAINED_IFLAG"
  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="CONSTRAINED_IFLAG"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Interp_Reord"
  dst-port="SUB_MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_TYPE"/>
<Connection dst="AVCDecoder_Decode_V_Buffer_inter"
  dst-port="FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="FRAME_NUM"/>
<Connection dst="AVCDecoder_Decode_V_Buffer_inter"
  dst-port="DEL_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="DEL_LIST"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Interp_EighthPelBilinear"
  dst-port="MV"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="MV_OUT"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Interp_EighthPelBilinear"
  dst-port="PARTSZ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord" src-port="PARTSZ"/>
<Connection dst="AVCDecoder_Decode_V_Buffer_inter"
  dst-port="ENABLE_READ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="IS_NEW_MB_PIC"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Select_chroma"
  dst-port="IN_0" src="AVCDecoder_Syn_Parser_Algo_Parser_IPCM" src-port="I_PCM_V"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_DemuxParserInfos"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
```

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```
<Connection dst="AVCDecoder_Decode_V_PredictionC_Deblocking_Filter"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Buffer_Neighbour_FullMb"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection dst="AVCDecoder_Decode_V_Buffer_inter"
  dst-port="FRAME_TO_READ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum" src-port="READ_FRAME"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Deblocking_Filter"
  dst-port="BS"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter" src-port="BS"/>
<Connection dst="AVCDecoder_Decode_V_Buffer_inter"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Deblocking_Filter"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_DemuxParserInfos"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Intra8x8_Buffer_Neighbour_FullMb"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Interp_Reord"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_Algo_DCR_Hadamard_CHROMA"
  dst-port="QP" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP_Cr"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
  dst-port="QP" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP_Cr"/>
<Connection dst="AVCDecoder_Decode_V_Buffer_inter" dst-port="RA"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_Mgnt_InterPred" src-port="R_ADDR_C"/>
<Connection dst="AVCDecoder_Decode_V_PredictionC_Deblocking_Filter"
  dst-port="MB_DBF_PARAM"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter" src-port="MB_DBF_PARAM_V"/>
<Connection dst="AVCDecoder_CavlcExpand_BlockSplit" dst-port="BLOCK"
  src="AVCDecoder_CavlcExpand_BlockExpand" src-port="BLOCK"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IS_Zigzag_4x4_AC"
  dst-port="X" src="AVCDecoder_CavlcExpand_BlockSplit" src-port="BLOCK_Y_AC"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_IS_Zigzag_4x4_DC"
  dst-port="X" src="AVCDecoder_CavlcExpand_BlockSplit" src-port="BLOCK_Y_DC"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Algo_IS_Zigzag_4x4"
  dst-port="X" src="AVCDecoder_CavlcExpand_BlockSplit" src-port="BLOCK_U_AC"/>
<Connection
  dst="AVCDecoder_Decode_U_ResidualC_Algo_DCR_Hadamard_CHROMA"
  dst-port="IN" src="AVCDecoder_CavlcExpand_BlockSplit" src-port="BLOCK_U_DC"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_Algo_IS_Zigzag_4x4"
  dst-port="X" src="AVCDecoder_CavlcExpand_BlockSplit" src-port="BLOCK_V_AC"/>
<Connection
  dst="AVCDecoder_Decode_V_ResidualC_Algo_DCR_Hadamard_CHROMA"
  dst-port="IN" src="AVCDecoder_CavlcExpand_BlockSplit" src-port="BLOCK_V_DC"/>
<Connection dst="AVCDecoder_CavlcExpand_BlockExpand"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection dst="AVCDecoder_CavlcExpand_BlockSplit"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection dst="AVCDecoder_CavlcExpand_BlockExpand" dst-port="LAST"
  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="LAST"/>
```

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```
  <Connection dst="AVCDecoder_CavlcExpand_BlockExpand" dst-port="RUN"
    src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="RUN"/>
  <Connection dst="AVCDecoder_CavlcExpand_BlockExpand"
    dst-port="VALUE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="VALUE"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererY"
    dst-port="POC_DISPLAY"
    src="AVCDecoder_Display_Render_Mgnt_Display_Poc" src-port="POC_DISPLAY"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererV"
    dst-port="POC_DISPLAY"
    src="AVCDecoder_Display_Render_Mgnt_Display_Poc" src-port="POC_DISPLAY"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererU"
    dst-port="POC_DISPLAY"
    src="AVCDecoder_Display_Render_Mgnt_Display_Poc" src-port="POC_DISPLAY"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererY"
    dst-port="POC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="POC"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererU"
    dst-port="POC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="POC"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererV"
    dst-port="POC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="POC"/>
  <Connection dst="AVCDecoder_Display_Render_Mgnt_Display_Poc"
    dst-port="POC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="POC"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererY"
    dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererU"
    dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererV"
    dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
  <Connection dst="AVCDecoder_Display_Render_Mgnt_Display_Poc"
    dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
  <Connection dst="AVCDecoder_Display_Render_Mgnt_Display_Poc"
    dst-port="EMPTY_DBP"
    src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="EMPTY_DPB"/>
  <Connection dst="AVCDecoder_Display_Render_Mgnt_Display_Poc"
    dst-port="DBP_MAX_SZ" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="DBP_MAX_SZ"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererY"
    dst-port="WD"
    src="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter" src-port="MB_OUT"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererU"
    dst-port="WD"
    src="AVCDecoder_Decode_U_PredictionC_Deblocking_Filter" src-port="MB_OUT"/>
  <Connection dst="AVCDecoder_Display_Render_DisplayRendererV"
    dst-port="WD"
    src="AVCDecoder_Decode_V_PredictionC_Deblocking_Filter" src-port="MB_OUT"/>
  <Connection dst="Merger" dst-port="U"
    src="AVCDecoder_Display_Render_DisplayRendererU" src-port="O"/>
  <Connection dst="Merger" dst-port="V"
    src="AVCDecoder_Display_Render_DisplayRendererV" src-port="O"/>
  <Connection dst="Merger" dst-port="Y"
    src="AVCDecoder_Display_Render_DisplayRendererY" src-port="O"/>
  <Connection dst="display" dst-port="WIDTH"
    src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="WIDTH"/>
  <Connection dst="display" dst-port="HEIGHT"
    src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="HEIGHT"/>
  <Connection dst="AVCDecoder_Syn_Parser_Algo_Synp" dst-port="BYTE"
    src="source" src-port="O"/>
</XDF>
```

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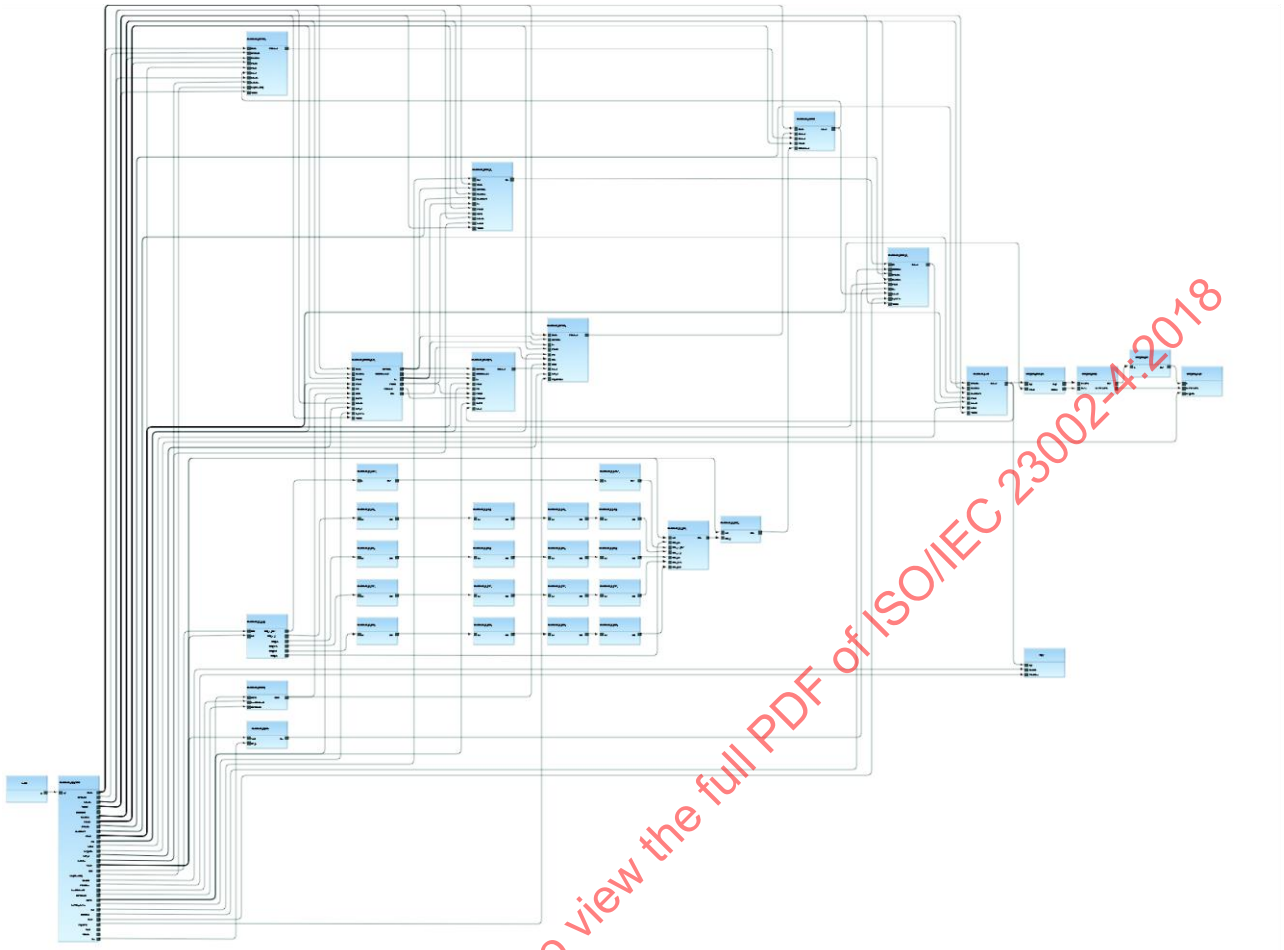
B.4 FNL of HEVC Main Profile



FNL specification of the HEVC Main Profile decoder (refer to Top_mpegh_part2_main_decoder.xdf file).

```
<?xml version="1.0" encoding="UTF-8"?>
<XDF name="Top_mpegh_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.mpegh.part2.main.synParser.Algo_Parser"/>
  </Instance>
  <Instance id="HevcDecoder_IntraPrediction">
    <Class name="devel.org.sc29.wg11.mpegh.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.mpegh.part2.SelectCu"/>
  </Instance>
```

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```
<Instance id="HevcDecoder_DecodedPictureBuffer">
  <Class name="devel.org.sc29.wg11.mpegh.part2.main.inter.DecodedPictureBuffer"/>
</Instance>
<Instance id="HevcDecoder_InterPrediction">
  <Class name="devel.org.sc29.wg11.mpegh.part2.main.inter.InterPrediction"/>
</Instance>
<Instance id="HevcDecoder_SAO">
  <Class name="devel.org.sc29.wg11.mpegh.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.mpegh.part2.main.Filters.QpGen"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT_Splitter">
  <Class name="devel.org.sc29.wg11.mpegh.part2.main.IT.IT_Splitter"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT_Merger">
  <Class name="devel.org.sc29.wg11.mpegh.part2.main.IT.IT_Merger"/>
</Instance>
<Instance id="HevcDecoder_xIT_invDST4x4_1st">
  <Class name="devel.org.sc29.wg11.mpegh.part2.main.IT.invDST4x4_1st"/>
</Instance>
<Instance id="HevcDecoder_xIT_invDST4x4_2nd">
  <Class name="devel.org.sc29.wg11.mpegh.part2.main.IT.invDST4x4_2nd"/>
</Instance>
<Instance id="HevcDecoder_xIT_Block_Merger">
  <Class name="devel.org.sc29.wg11.mpegh.part2.main.IT.Block_Merge"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT4x4_IT4x4_1d_0">
  <Class name="devel.org.sc29.wg11.mpegh.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.mpegh.part2.main.IT.Transpose4x4"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT4x4_IT4x4_1d_1">
  <Class name="devel.org.sc29.wg11.mpegh.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.mpegh.part2.main.IT.Transpose4x4"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT8x8_IT8x8_1d_0">
  <Class name="devel.org.sc29.wg11.mpegh.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.mpegh.part2.main.IT.Transpose8x8"/>
</Instance>
<Instance id="HevcDecoder_xIT_IT8x8_IT8x8_1d_1">
  <Class name="devel.org.sc29.wg11.mpegh.part2.main.IT.IT8x8_1d"/>
  <Parameter name="shift">
```

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```
      <Expr kind="Literal" literal-kind="Integer" value="12"/>
    </Parameter>
  </Instance>
  <Instance id="HevcDecoder_xIT_IT8x8_Transpose8x8_1">
    <Class name="devel.org.sc29.wg11.mpegh.part2.main.IT.Transpose8x8"/>
  </Instance>
  <Instance id="HevcDecoder_xIT_IT16x16_IT16x16_1d_0">
    <Class name="devel.org.sc29.wg11.mpegh.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.mpegh.part2.main.IT.Transpose16x16"/>
  </Instance>
  <Instance id="HevcDecoder_xIT_IT16x16_IT16x16_1d_1">
    <Class name="devel.org.sc29.wg11.mpegh.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.mpegh.part2.main.IT.Transpose16x16"/>
  </Instance>
  <Instance id="HevcDecoder_xIT_IT32x32_IT32x32_1d_0">
    <Class name="devel.org.sc29.wg11.mpegh.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.mpegh.part2.main.IT.Transpose32x32"/>
  </Instance>
  <Instance id="HevcDecoder_xIT_IT32x32_IT32x32_1d_1">
    <Class name="devel.org.sc29.wg11.mpegh.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.mpegh.part2.main.IT.Transpose32x32"/>
  </Instance>
  <Instance id="HevcDecoder_DBFilter_DeblockFilt">
    <Class name="devel.org.sc29.wg11.mpegh.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.mpegh.part2.main.Filters.GenerateBs"/>
  </Instance>
  <Instance id="HevcDecoder_generateInfo_GenerateRefList">
    <Class name="devel.org.sc29.wg11.mpegh.part2.main.inter.GenerateRefList"/>
  </Instance>
```

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```
<Instance id="HevcDecoder_generateInfo_MvComponentPred">
  <Class name="devel.org.sc29.wg11.mpegh.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.mpegh.part2.common.padding"/>
</Instance>
<Instance id="MD5_shifter">
  <Class name="devel.org.sc29.wg11.mpegh.part2.common.MD5Shifter"/>
</Instance>
<Instance id="MD5_compute">
  <Class name="devel.org.sc29.wg11.mpegh.part2.common.MD5Compute"/>
</Instance>
<Instance id="MD5_MD5SplitInfo">
  <Class name="devel.org.sc29.wg11.mpegh.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"/>
<Connection dst="HevcDecoder_IntraPrediction" dst-port="PartMode"
  src="HevcDecoder_Algo_Parser" src-port="PartMode"/>
<Connection dst="HevcDecoder_IntraPrediction" dst-port="SplitTransform"
  src="HevcDecoder_Algo_Parser" src-port="SplitTransform"/>
<Connection dst="HevcDecoder_IntraPrediction" dst-port="SliceAddr"
  src="HevcDecoder_Algo_Parser" src-port="SliceAddr"/>
<Connection dst="HevcDecoder_SelectCU" dst-port="IntraSample"
  src="HevcDecoder_IntraPrediction" src-port="PredSample"/>
<Connection dst="HevcDecoder_SelectCU" dst-port="PartMode"
  src="HevcDecoder_Algo_Parser" src-port="PartMode"/>
<Connection dst="HevcDecoder_SelectCU" dst-port="CUInfo"
  src="HevcDecoder_Algo_Parser" src-port="CUInfo"/>
<Connection dst="HevcDecoder_IntraPrediction" dst-port="StrongIntraSmoothing"
  src="HevcDecoder_Algo_Parser" src-port="StrongIntraSmoothing"/>
<Connection dst="HevcDecoder_DecodedPictureBuffer" dst-port="Poc"
  src="HevcDecoder_Algo_Parser" src-port="Poc"/>
<Connection dst="HevcDecoder_DecodedPictureBuffer"
  dst-port="PictSize" src="HevcDecoder_Algo_Parser" src-port="PictSize"/>
<Connection dst="HevcDecoder_DecodedPictureBuffer"
  dst-port="RpsPoc" src="HevcDecoder_Algo_Parser" src-port="RefPoc"/>
<Connection dst="HevcDecoder_InterPrediction" dst-port="CUInfo"
  src="HevcDecoder_Algo_Parser" src-port="CUInfo"/>
<Connection dst="HevcDecoder_InterPrediction" dst-port="PartMode"
  src="HevcDecoder_Algo_Parser" src-port="PartMode"/>
<Connection dst="HevcDecoder_InterPrediction" dst-port="Poc"
  src="HevcDecoder_Algo_Parser" src-port="Poc"/>
<Connection dst="HevcDecoder_InterPrediction" dst-port="Sample"
  src="HevcDecoder_DecodedPictureBuffer" src-port="RefSample"/>
<Connection dst="HevcDecoder_InterPrediction" dst-port="SliceType"
  src="HevcDecoder_Algo_Parser" src-port="SliceType"/>
<Connection dst="HevcDecoder_SelectCU" dst-port="InterSample"
  src="HevcDecoder_InterPrediction" src-port="PredSample"/>
<Connection dst="HevcDecoder_IntraPrediction" dst-port="Sample"
```

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```
  src="HevcDecoder_SelectCU" src-port="Sample"/>
<Connection dst="HevcDecoder_SAO" dst-port="SaoSe"
  src="HevcDecoder_Algo_Parser" src-port="SaoSe">
  <Attribute kind="Value" name="bufferSize">
    <Expr kind="Literal" literal-kind="Integer" value="16384"/>
  </Attribute>
</Connection>
<Connection dst="HevcDecoder_SAO" dst-port="IsPicSlcLcu"
  src="HevcDecoder_Algo_Parser" src-port="IsPicSlcLcu"/>
<Connection dst="HevcDecoder_SAO" dst-port="PicSize"
  src="HevcDecoder_Algo_Parser" src-port="PictSize"/>
<Connection dst="HevcDecoder_DecodedPictureBuffer"
  dst-port="Sample" src="HevcDecoder_SAO" src-port="FiltSample"/>
<Connection dst="HevcDecoder_QpGen" dst-port="TuSize"
  src="HevcDecoder_Algo_Parser" src-port="TUSize"/>
<Connection dst="HevcDecoder_QpGen" dst-port="QP_IN"
  src="HevcDecoder_Algo_Parser" src-port="Qp"/>
<Connection dst="HevcDecoder_InterPrediction"
  dst-port="WeightedPredSe" src="HevcDecoder_Algo_Parser" src-port="weightedPred">
  <Attribute kind="Value" name="bufferSize">
    <Expr kind="Literal" literal-kind="Integer" value="16384"/>
  </Attribute>
</Connection>
<Connection dst="HevcDecoder_SAO" dst-port="LFAcrossSlcTile"
  src="HevcDecoder_Algo_Parser" src-port="LFAcrossSlcTile"/>
<Connection dst="HevcDecoder_IntraPrediction" dst-port="LcuSizeMax"
  src="HevcDecoder_Algo_Parser" src-port="LcuSizeMax"/>
<Connection dst="HevcDecoder_SAO" dst-port="LcuSizeMax"
  src="HevcDecoder_Algo_Parser" src-port="LcuSizeMax"/>
<Connection dst="HevcDecoder_IntraPrediction" dst-port="TilesCoord"
  src="HevcDecoder_Algo_Parser" src-port="TilesCoord"/>
<Connection dst="HevcDecoder_SAO" dst-port="TilesCoord"
  src="HevcDecoder_Algo_Parser" src-port="TilesCoord"/>
<Connection dst="HevcDecoder_xIT_invDST4x4_1st" dst-port="IN"
  src="HevcDecoder_xIT_IT_Splitter" src-port="Coeff_4x4_DST"/>
<Connection dst="HevcDecoder_xIT_invDST4x4_2nd" dst-port="IN"
  src="HevcDecoder_xIT_invDST4x4_1st" src-port="OUT"/>
<Connection dst="HevcDecoder_xIT_IT_Merger" dst-port="Block_4x4_DST"
  src="HevcDecoder_xIT_invDST4x4_2nd" src-port="OUT"/>
<Connection dst="HevcDecoder_xIT_IT_Merger" dst-port="Block_skip"
  src="HevcDecoder_xIT_IT_Splitter" src-port="Coeff_skip"/>
<Connection dst="HevcDecoder_xIT_Block_Merger" dst-port="Block_in"
  src="HevcDecoder_xIT_IT_Merger" src-port="Block"/>
<Connection dst="HevcDecoder_xIT_IT4x4_Transpose4x4_1"
  dst-port="Src" src="HevcDecoder_xIT_IT4x4_IT4x4_1d_0" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT4x4_IT4x4_1d_1" dst-port="Src"
  src="HevcDecoder_xIT_IT4x4_Transpose4x4_1" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT4x4_IT4x4_1d_0" dst-port="Src"
  src="HevcDecoder_xIT_IT4x4_Transpose4x4_0" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT_Merger" dst-port="Block_4x4_IT"
  src="HevcDecoder_xIT_IT4x4_IT4x4_1d_1" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT4x4_Transpose4x4_0"
  dst-port="Src" src="HevcDecoder_xIT_IT_Splitter" src-port="Coeff_4x4_IT"/>
<Connection dst="HevcDecoder_xIT_IT8x8_Transpose8x8_1"
  dst-port="Src" src="HevcDecoder_xIT_IT8x8_IT8x8_1d_0" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT8x8_IT8x8_1d_1" dst-port="Src"
  src="HevcDecoder_xIT_IT8x8_Transpose8x8_1" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT8x8_IT8x8_1d_0" dst-port="Src"
  src="HevcDecoder_xIT_IT8x8_Transpose8x8_0" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT_Merger" dst-port="Block_8x8"
```

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```
  src="HevcDecoder_xIT_IT8x8_IT8x8_1d_1" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT8x8_Transpose8x8_0"
  dst-port="Src" src="HevcDecoder_xIT_IT_Splitter" src-port="Coeff_8x8"/>
<Connection dst="HevcDecoder_xIT_IT16x16_Transpose16x16_1"
  dst-port="Src" src="HevcDecoder_xIT_IT16x16_IT16x16_1d_0" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT16x16_IT16x16_1d_1"
  dst-port="Src" src="HevcDecoder_xIT_IT16x16_Transpose16x16_1" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT16x16_IT16x16_1d_0"
  dst-port="Src" src="HevcDecoder_xIT_IT16x16_Transpose16x16_0" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT_Merger" dst-port="Block_16x16"
  src="HevcDecoder_xIT_IT16x16_IT16x16_1d_1" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT16x16_Transpose16x16_0"
  dst-port="Src" src="HevcDecoder_xIT_IT_Splitter" src-port="Coeff_16x16"/>
<Connection dst="HevcDecoder_xIT_IT32x32_IT32x32_1d_1"
  dst-port="Src" src="HevcDecoder_xIT_IT32x32_Transpose32x32_1" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT32x32_Transpose32x32_1"
  dst-port="Src" src="HevcDecoder_xIT_IT32x32_IT32x32_1d_0" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT32x32_IT32x32_1d_0"
  dst-port="Src" src="HevcDecoder_xIT_IT32x32_Transpose32x32_0" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT_Merger" dst-port="Block_32x32"
  src="HevcDecoder_xIT_IT32x32_IT32x32_1d_1" src-port="Dst"/>
<Connection dst="HevcDecoder_xIT_IT32x32_Transpose32x32_0"
  dst-port="Src" src="HevcDecoder_xIT_IT_Splitter" src-port="Coeff_32x32"/>
<Connection dst="HevcDecoder_SelectCU" dst-port="ResidualSample"
  src="HevcDecoder_xIT_Block_Merger" src-port="Block"/>
<Connection dst="HevcDecoder_xIT_IT_Splitter" dst-port="Size"
  src="HevcDecoder_Algo_Parser" src-port="TUSize"/>
<Connection dst="HevcDecoder_xIT_IT_Merger" dst-port="Size"
  src="HevcDecoder_Algo_Parser" src-port="TUSize"/>
<Connection dst="HevcDecoder_xIT_Block_Merger" dst-port="Size"
  src="HevcDecoder_Algo_Parser" src-port="TUSize"/>
<Connection dst="HevcDecoder_xIT_IT_Splitter" dst-port="Coeff"
  src="HevcDecoder_Algo_Parser" src-port="Coeff"/>
<Connection dst="HevcDecoder_DBFilter_DeblockFilt" dst-port="Bs"
  src="HevcDecoder_DBFilter_GenerateBs" src-port="BS"/>
<Connection dst="HevcDecoder_SAO" dst-port="SampleIn"
  src="HevcDecoder_DBFilter_DeblockFilt" src-port="FiltSample"/>
<Connection dst="HevcDecoder_DBFilter_DeblockFilt" dst-port="Qp"
  src="HevcDecoder_QpGen" src-port="Qp"/>
<Connection dst="HevcDecoder_DBFilter_GenerateBs" dst-port="CUInfo"
  src="HevcDecoder_Algo_Parser" src-port="CUInfo"/>
<Connection dst="HevcDecoder_DBFilter_GenerateBs" dst-port="Cbf"
  src="HevcDecoder_Algo_Parser" src-port="Cbf"/>
<Connection dst="HevcDecoder_DBFilter_GenerateBs"
  dst-port="SplitTransf" src="HevcDecoder_Algo_Parser" src-port="SplitTransform"/>
<Connection dst="HevcDecoder_DBFilter_GenerateBs"
  dst-port="PartMode" src="HevcDecoder_Algo_Parser" src-port="PartMode"/>
<Connection dst="HevcDecoder_DBFilter_GenerateBs"
  dst-port="SliceAddr" src="HevcDecoder_Algo_Parser" src-port="SliceAddr"/>
<Connection dst="HevcDecoder_DBFilter_DeblockFilt"
  dst-port="PicSize" src="HevcDecoder_Algo_Parser" src-port="PictSize"/>
<Connection dst="HevcDecoder_DBFilter_DeblockFilt"
  dst-port="IsPicSlcLcu" src="HevcDecoder_Algo_Parser" src-port="IsPicSlcLcu"/>
<Connection dst="HevcDecoder_DBFilter_DeblockFilt"
  dst-port="DBFDisable" src="HevcDecoder_Algo_Parser" src-port="DBFDisable"/>
<Connection dst="HevcDecoder_DBFilter_DeblockFilt"
  dst-port="SampleIn" src="HevcDecoder_SelectCU" src-port="Sample"/>
<Connection dst="HevcDecoder_DBFilter_GenerateBs" dst-port="LFAcrossSlcTile"
  src="HevcDecoder_Algo_Parser" src-port="LFAcrossSlcTile"/>
<Connection dst="HevcDecoder_DBFilter_GenerateBs"
```

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```
  dst-port="LcuSizeMax" src="HevcDecoder_Algo_Parser" src-port="LcuSizeMax"/>
<Connection dst="HevcDecoder_DBFilter_DeblockFilt"
  dst-port="LcuSizeMax" src="HevcDecoder_Algo_Parser" src-port="LcuSizeMax"/>
<Connection dst="HevcDecoder_DBFilter_GenerateBs"
  dst-port="TilesCoord" src="HevcDecoder_Algo_Parser" src-port="TilesCoord"/>
<Connection dst="HevcDecoder_DBFilter_DeblockFilt"
  dst-port="TilesCoord" src="HevcDecoder_Algo_Parser" src-port="TilesCoord"/>
<Connection dst="HevcDecoder_DBFilter_DeblockFilt"
  dst-port="SyntaxElem" src="HevcDecoder_Algo_Parser" src-port="DbfSe"/>
<Connection dst="HevcDecoder_generateInfo_MvComponentPred"
  dst-port="RefList"
  src="HevcDecoder_generateInfo_GenerateRefList" src-port="RefList"/>
<Connection dst="HevcDecoder_InterPrediction" dst-port="RefIdx"
  src="HevcDecoder_generateInfo_MvComponentPred" src-port="RefIdx"/>
<Connection dst="HevcDecoder_InterPrediction" dst-port="RefList"
  src="HevcDecoder_generateInfo_GenerateRefList" src-port="RefList"/>
<Connection dst="HevcDecoder_InterPrediction"
  dst-port="IsBiPredOrLx"
  src="HevcDecoder_generateInfo_MvComponentPred" src-port="IsBiPredOrLx"/>
<Connection dst="HevcDecoder_InterPrediction" dst-port="Mv"
  src="HevcDecoder_generateInfo_MvComponentPred" src-port="Mv"/>
<Connection dst="HevcDecoder_DecodedPictureBuffer"
  dst-port="IsBiPredOrLx"
  src="HevcDecoder_generateInfo_MvComponentPred" src-port="IsBiPredOrLx"/>
<Connection dst="HevcDecoder_DecodedPictureBuffer"
  dst-port="IsReadOrNewSlc"
  src="HevcDecoder_generateInfo_MvComponentPred" src-port="IsReadOrNewSlice"/>
<Connection dst="HevcDecoder_DecodedPictureBuffer" dst-port="Mv"
  src="HevcDecoder_generateInfo_MvComponentPred" src-port="Mv"/>
<Connection dst="HevcDecoder_DecodedPictureBuffer"
  dst-port="PredCuSize"
  src="HevcDecoder_generateInfo_MvComponentPred" src-port="PredCuSize"/>
<Connection dst="HevcDecoder_DecodedPictureBuffer" dst-port="PocRef"
  src="HevcDecoder_generateInfo_MvComponentPred" src-port="PocRef"/>
<Connection dst="HevcDecoder_DBFilter_GenerateBs" dst-port="Mv"
  src="HevcDecoder_generateInfo_MvComponentPred" src-port="Mv"/>
<Connection dst="HevcDecoder_DBFilter_GenerateBs"
  dst-port="IsBiPredOrLx"
  src="HevcDecoder_generateInfo_MvComponentPred" src-port="IsBiPredOrLx"/>
<Connection dst="HevcDecoder_DBFilter_GenerateBs" dst-port="RefPoc"
  src="HevcDecoder_generateInfo_MvComponentPred" src-port="PocRef"/>
<Connection dst="HevcDecoder_generateInfo_MvComponentPred"
  dst-port="PartMode" src="HevcDecoder_Algo_Parser" src-port="PartMode"/>
<Connection dst="HevcDecoder_generateInfo_MvComponentPred"
  dst-port="PicSize" src="HevcDecoder_Algo_Parser" src-port="PictSize"/>
<Connection dst="HevcDecoder_generateInfo_GenerateRefList"
  dst-port="RefPoc" src="HevcDecoder_Algo_Parser" src-port="RefPoc"/>
<Connection dst="HevcDecoder_generateInfo_MvComponentPred"
  dst-port="RpsPoc" src="HevcDecoder_Algo_Parser" src-port="RefPoc"/>
<Connection dst="HevcDecoder_generateInfo_MvComponentPred"
  dst-port="SliceType" src="HevcDecoder_Algo_Parser" src-port="SliceType"/>
<Connection dst="HevcDecoder_generateInfo_MvComponentPred"
  dst-port="SliceAddr" src="HevcDecoder_Algo_Parser" src-port="SliceAddr"/>
<Connection dst="HevcDecoder_generateInfo_MvComponentPred"
  dst-port="Poc" src="HevcDecoder_Algo_Parser" src-port="Poc"/>
<Connection dst="HevcDecoder_generateInfo_MvComponentPred"
  dst-port="CUInfo" src="HevcDecoder_Algo_Parser" src-port="CUInfo"/>
<Connection dst="HevcDecoder_generateInfo_MvComponentPred"
  dst-port="SyntaxElem" src="HevcDecoder_Algo_Parser" src-port="MvPredSyntaxElem"/>
<Connection dst="HevcDecoder_generateInfo_GenerateRefList" dst-port="NumRefIdxLXAct"
```

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```
    src="HevcDecoder_Algo_Parser" src-port="NumRefIdxLxActive"/>
  <Connection dst="HevcDecoder_generateInfo_GenerateRefList" dst-port="RefPicListModif"
    src="HevcDecoder_Algo_Parser" src-port="RefPicListModif"/>
  <Connection dst="HevcDecoder_generateInfo_MvComponentPred"
    dst-port="LcuSizeMax" src="HevcDecoder_Algo_Parser" src-port="LcuSizeMax"/>
  <Connection dst="HevcDecoder_generateInfo_MvComponentPred"
    dst-port="TilesCoord" src="HevcDecoder_Algo_Parser" src-port="TilesCoord"/>
  <Connection dst="display" dst-port="DispCoord"
    src="HevcDecoder_Algo_Parser" src-port="DispCoord"/>
  <Connection dst="display" dst-port="PicSizeInMb"
    src="HevcDecoder_Algo_Parser" src-port="PicSizeInMb"/>
  <Connection dst="display" dst-port="Byte" src="HevcDecoder_SAO"
    src-port="FiltSample"/>
  <Connection dst="HevcDecoder_Algo_Parser" dst-port="byte"
    src="Source" src-port="O"/>
  <Connection dst="MD5_shifter" dst-port="IN" src="MD5_padding" src-port="OUT"/>
  <Connection dst="MD5_padding" dst-port="DATA" src="MD5_MD5SplitInfo"
    src-port="DataOut"/>
  <Connection dst="MD5_padding" dst-port="LENGTH"
    src="MD5_MD5SplitInfo" src-port="Length"/>
  <Connection dst="MD5_compute" dst-port="IN" src="MD5_shifter" src-port="OUT"/>
  <Connection dst="MD5_compute" dst-port="NEWLENGTH" src="MD5_padding"
    src-port="NEWLENGTH"/>
  <Connection dst="MD5_compute" dst-port="REF" src="MD5_MD5SplitInfo"
    src-port="REF_MD5"/>
  <Connection dst="MD5_MD5SplitInfo" dst-port="Byte"
    src="HevcDecoder_SAO" src-port="FiltSample"/>
  <Connection dst="MD5_MD5SplitInfo" dst-port="SEI_MD5"
    src="HevcDecoder_Algo_Parser" src-port="SEI_MD5"/>
  <Connection dst="MD5_MD5SplitInfo" dst-port="PictSize"
    src="HevcDecoder_Algo_Parser" src-port="PictSize"/>
</XDF>
```

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Annex C
(informative)

FNL of MPEG-4 AVC Progressive High Profile decoder

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Figure C.2 — Complete example of the FU network description of the MPEG-4 AVC Progressive High Profile decoder (refer to Top_mpeg4_part10_PHP_decoder.xdf file)

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Complete example of a graphical representation of the MPEG-4 AVC Progressive High Profile decoder (refer to Top_mpeg4_part10_PHP_decoder.xdf).


```
<?xml version="1.0" encoding="UTF-8"?>
<XDF name="Top_mpeg4_part10_PHP_decoder">
  <Instance id="source">
    <Class name="org.sc29.wg11.stdio.Source"/>
  </Instance>
  <Instance id="Merger">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.display.Mgnt_Merger420_AVC"/>
  </Instance>
  <Instance id="display">
    <Class name="org.sc29.wg11.video.DisplayYUV"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Algo_Synp">
    <Class name="org.sc29.wg11.mpeg4.part10.php.synParser.Algo_SynP"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Algo_Parser_IPCM">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.synParser.Algo_Parser_IPCM"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_IntraPredSplit">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.synParser.Algo_IntraPred_Split"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_MMCO"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_RefList"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_Mgnt_InterPred">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Mgnt_InterPred"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.deblockingFilter.Mgnt_DBF_AdaptiveFilter"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_RefList"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr">
    <Class name="org.sc29.wg11.mpeg4.part10.php.interPred.Algo_MvLXReconstr"/>
    <Parameter name="IsPredL0">
      <Expr kind="Literal" literal-kind="Boolean" value="true"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_RefIdxtoFrameNum"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord">
    <Class name="org.sc29.wg11.mpeg4.part10.php.deblockingFilter.Algo_MvComponentReorder"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr">
    <Class name="org.sc29.wg11.mpeg4.part10.php.interPred.Algo_MvLXReconstr"/>
    <Parameter name="IsPredL0">
      <Expr kind="Literal" literal-kind="Boolean" value="false"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL1ToFrameNum">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_RefIdxtoFrameNum"/>
  </Instance>
  <Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer">
```


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```
  <Class name="org.sc29.wg11.mpeg4.part10.php.interPred.Algo_MvBuffer"/>
</Instance>
<Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX">
  <Class name="org.sc29.wg11.mpeg4.part10.php.interPred.Mgnt_SelectMvpLX"/>
</Instance>
<Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectRefIdx">
  <Class name="org.sc29.wg11.mpeg4.part10.php.interPred.Mgnt_SelectRefIdx"/>
</Instance>
<Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_FrameNumToPocList">
  <Class name="org.sc29.wg11.mpeg4.part10.php.interPred.Algo_FrameNumToPocList"/>
</Instance>
<Instance id="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_GeneratePredWeight">
  <Class name="org.sc29.wg11.mpeg4.part10.php.interPred.Algo_GeneratePredWeight"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_DecodedPictureBuffer">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Mgnt_DPB"/>
  <Parameter name="MB_WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="16"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Select">
  <Class name="org.sc29.wg11.common.Algo_SelectMB_8"/>
  <Parameter name="WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="256"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter">
  <Class name="org.sc29.wg11.mpeg4.part10.php.deblockingFilter.Algo_DBF_AdaptiveFilter"/>
  <Parameter name="ChromaEdgeFlag">
    <Expr kind="Literal" literal-kind="Boolean" value="false"/>
  </Parameter>
  <Parameter name="MbWidth">
    <Expr kind="Literal" literal-kind="Integer" value="16"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos">
  <Class name="org.sc29.wg11.mpeg4.part10.php.selecMacroblock.Algo_DemuxParserInfoForBlocks_Luma"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Intra_16x16"/>
  <Parameter name="MB_WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="16"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_IntraPred_LUMA_16x16"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Add_Clip">
  <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Buffer_Neighbour_FullMb">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Buffer_Neighbour_FullMb"/>
  <Parameter name="IsChroma">
    <Expr kind="Literal" literal-kind="Boolean" value="false"/>
  </Parameter>
  <Parameter name="MB_WIDTH">
    <Expr kind="Literal" literal-kind="Integer" value="16"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4">
```

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```
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Intra_4x4"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_IntraPred_LUMA_4x4"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Add_4x4">
  <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Merge_4x4_to_16x16_norasterscan">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_Merge_4x4_to_16x16_norasterscan"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Split_16x16_to_4x4_norasterscan">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_Split_16x16_to_4x4_norasterscan"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Buffer_Neighbour_4x4">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Buffer_Neighbour_YxY"/>
  <Parameter name="IsIntra4x4">
    <Expr kind="Literal" literal-kind="Boolean" value="true"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_SeparableSixTapQuarterPelAVC">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_Interp_SeparableSixTapQuarterPel"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Inter_Add_Clip">
  <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_Reord">
  <Class name="org.sc29.wg11.mpeg4.part10.php.interPred.Algo_Interp_Reord"/>
  <Parameter name="SzSidePerPart">
    <Expr kind="Literal" literal-kind="Integer" value="4"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Mgnt_Intra8x8">
  <Class name="org.sc29.wg11.mpeg4.part10.php.intraPred.Mgnt_Intra_8x8"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_IntraPred_LUMA_8x8">
  <Class name="org.sc29.wg11.mpeg4.part10.php.intraPred.Algo_IntraPred_LUMA_8x8"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_Add_8x8">
  <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_Merge_8x8_to_16x16_norasterscan">
  <Class name="org.sc29.wg11.mpeg4.part10.php.intraPred.Algo_Merge_8x8_to_16x16_norasterscan"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Buffer_Neighbour_8x8">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Buffer_Neighbour_YxY"/>
  <Parameter name="IsIntra4x4">
    <Expr kind="Literal" literal-kind="Boolean" value="false"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_Split_16x16_to_8x8_norasterscan">
  <Class name="org.sc29.wg11.mpeg4.part10.php.intraPred.Algo_Split_16x16_to_8x8_norasterscan"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_Algo_Merge_4x4_to_16x16">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Merge_4x4_to_16x16"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_demux">
  <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Mgnt_I4x4_I8x8_demux"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_mux">
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  <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Mgnt_I4x4_I8x8_mux"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_Algo_Merge_8x8_to_16x16">
  <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Algo_Merge_8x8_to_16x16"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_IS_Zigzag_4x4_DC">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IS_Zigzag_4x4"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_IHT1d_0">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_LUMA_IHT1d"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_0">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_IHT1d_1">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_LUMA_IHT1d"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Scaling">
  <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Algo_DCR_Hadamard_LUMA_Scaling"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_1">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Reordering">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_DCR_Hadamard_LUMA_Reordering"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IS_Zigzag_4x4_AC">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IS_Zigzag_4x4"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Mgnt_IQ_INTRA16x16">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Mgnt_IQ_INTRA16x16"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IQ_QSAndSLAndIDCTScaler_4x4">
  <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Algo_IQ_QSAndSLAndIDCTScaler_4x4"/>
  <Parameter name="NB4x4">
    <Expr kind="Literal" literal-kind="Integer" value="16"/>
  </Parameter>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_1d_0">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_1d"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_Transpose4x4_0">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_1d_1">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_1d"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_Transpose4x4_1">
  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
</Instance>
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  <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_Addshift"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_8x8_Algo_IS_Zigzag_8x8_AC">
  <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Algo_IS_Zigzag_8x8"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_8x8_Algo_ICT_IntraPred_8x8">
  <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Algo_IIT_8x8"/>
</Instance>
<Instance id="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_8x8_Algo_IQ_QSAndSLAndIDCTScaler_8x8">
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    <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Algo_IQ_QSAndSLAndIDCTScaler_8x8"/>
  </Instance>
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    <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Mgnt_DPB"/>
    <Parameter name="MB_WIDTH">
      <Expr kind="Literal" literal-kind="Integer" value="8"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_PredictionC_Select_chroma">
    <Class name="org.sc29.wg11.common.Algo_SelectMB_4"/>
    <Parameter name="WIDTH">
      <Expr kind="Literal" literal-kind="Integer" value="64"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_PredictionC_Deblocking_Filter">
    <Class name="org.sc29.wg11.mpeg4.part10.php.deblockingFilter.Algo_DBF_AdaptiveFilter"/>
    <Parameter name="ChromaEdgeFlag">
      <Expr kind="Literal" literal-kind="Boolean" value="true"/>
    </Parameter>
    <Parameter name="MbWidth">
      <Expr kind="Literal" literal-kind="Integer" value="8"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_PredictionC_DemuxParserInfos">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.selecMacroblock.Algo_DemuxParserInfoForBlocks_Chroma"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_IntraPred_CHROMA">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_IntraPred_CHROMA"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_PredictionC_Intra8x8_Algo_Add">
    <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_PredictionC_Intra8x8_Buffer_Neighbour_FullMb">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Buffer_Neighbour_FullMb"/>
    <Parameter name="IsChroma">
      <Expr kind="Literal" literal-kind="Boolean" value="true"/>
    </Parameter>
    <Parameter name="MB_WIDTH">
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  </Instance>
  <Instance id="AVCDecoder_Decode_U_PredictionC_Intra8x8_Mgnt_Intra_8x8">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Intra_16x16"/>
    <Parameter name="MB_WIDTH">
      <Expr kind="Literal" literal-kind="Integer" value="8"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_EighthPelBilinear">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_Interp_Bilinear"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Add">
    <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_PredictionC_Inter_Algo_Interp_Reord">
    <Class name="org.sc29.wg11.mpeg4.part10.php.interPred.Algo_Interp_Reord"/>
    <Parameter name="SzSidePerPart">
      <Expr kind="Literal" literal-kind="Integer" value="2"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_ResidualC_Algo_DCR_Hadamard_CHROMA">
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    <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Algo_DCR_Hadamard_CHROMA"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_ResidualC_Algo_Merge_4x4_to_8x8">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Merge_4x4_to_8x8"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Algo_IS_Zigzag_4x4">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IS_Zigzag_4x4"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Mgnt_IQ_Chroma">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Mgnt_IQ_Chroma"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_Algo_IQ_QSAndSLAndIDCTScaler_4x4">
    <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Algo_IQ_QSAndSLAndIDCTScaler_4x4"/>
    <Parameter name="NB4x4">
      <Expr kind="Literal" literal-kind="Integer" value="4"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_0">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_1d"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_0">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_1">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_1d"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_1">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_U_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_Addshift">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_Addshift"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_Buffer_inter">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Mgnt_DPB"/>
    <Parameter name="MB_WIDTH">
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    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_PredictionC_Select_chroma">
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    <Parameter name="WIDTH">
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    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_PredictionC_Deblocking_Filter">
    <Class name="org.sc29.wg11.mpeg4.part10.php.deblockingFilter.Algo_DBF_AdaptiveFilter"/>
    <Parameter name="ChromaEdgeFlag">
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    <Parameter name="MbWidth">
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    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_PredictionC_DemuxParserInfos">
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  </Instance>
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    <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Algo_IntraPred_CHROMA"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_PredictionC_Intra8x8_Algo_Add">
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    <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_PredictionC_Intra8x8_Buffer_Neighbour_FullMb">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Buffer_Neighbour_FullMb"/>
    <Parameter name="IsChroma">
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    <Parameter name="MB_WIDTH">
      <Expr kind="Literal" literal-kind="Integer" value="8"/>
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  </Instance>
  <Instance id="AVCDecoder_Decode_V_PredictionC_Intra8x8_Mgnt_Intra_8x8">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.intraPred.Mgnt_Intra_16x16"/>
    <Parameter name="MB_WIDTH">
      <Expr kind="Literal" literal-kind="Integer" value="8"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Interp_EighthPelBilinear">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.interPred.Algo_Interp_Bilinear"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Add">
    <Class name="org.sc29.wg11.common.Algo_AddPixSat"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_PredictionC_Inter_Algo_Interp_Reord">
    <Class name="org.sc29.wg11.mpeg4.part10.php.interPred.Algo_Interp_Reord"/>
    <Parameter name="SzSidePerPart">
      <Expr kind="Literal" literal-kind="Integer" value="2"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_ResidualC_Algo_DCR_Hadamard_CHROMA">
    <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Algo_DCR_Hadamard_CHROMA"/>
  </Instance>
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    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Merge_4x4_to_8x8"/>
  </Instance>
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    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IS_Zigzag_4x4"/>
  </Instance>
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    <Class name="org.sc29.wg11.mpeg4.part10.php.Residual.Algo_IQ_QSAndSLAndIDCTScaler_4x4"/>
    <Parameter name="NB4x4">
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  </Instance>
  <Instance id="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_1d_0">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_1d"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_0">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
  </Instance>
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    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_1d"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_Transpose4x4_1">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_Transpose4x4"/>
  </Instance>
  <Instance id="AVCDecoder_Decode_V_ResidualC_IS_IQ_IT_C_IT4x4_Algo_IT4x4_Addshift">
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    <Class name="org.sc29.wg11.mpeg4.part10.cbp.Residual.Algo_IT4x4_Addshift"/>
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    <Class name="org.sc29.wg11.mpeg4.part10.php.synParser.Algo_BlockExpand"/>
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  <Instance id="AVCDecoder_CavlcExpand_BlockSplit">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.synParser.Algo_BlockSplit"/>
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  <Instance id="AVCDecoder_Display_Render_DisplayRendererY">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.display.Mgnt_BufferRenderer"/>
    <Parameter name="MB_WIDTH">
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  <Instance id="AVCDecoder_Display_Render_DisplayRendererU">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.display.Mgnt_BufferRenderer"/>
    <Parameter name="MB_WIDTH">
      <Expr kind="Literal" literal-kind="Integer" value="8"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Display_Render_DisplayRendererV">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.display.Mgnt_BufferRenderer"/>
    <Parameter name="MB_WIDTH">
      <Expr kind="Literal" literal-kind="Integer" value="8"/>
    </Parameter>
  </Instance>
  <Instance id="AVCDecoder_Display_Render_Mgnt_Display_Poc">
    <Class name="org.sc29.wg11.mpeg4.part10.cbp.display.Mgnt_POC"/>
  </Instance>
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    dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
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    dst-port="INTRA_PRED_MODE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="INTRA_PRED_MODE"/>
  <Connection dst="AVCDecoder_Syn_Parser_IntraPredSplit"
    dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
  <Connection dst="AVCDecoder_Syn_Parser_IntraPredSplit"
    dst-port="CONSTRAINED_IFLAG"
    src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="CONSTRAINED_IFLAG"/>
  <Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
    dst-port="EMPTY_DPB"
    src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="EMPTY_DPB"/>
  <Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
    dst-port="ST_LIST"
    src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="ST_LIST"/>
  <Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
    dst-port="ST_LIST_SZ"
    src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="ST_LIST_SZ"/>
  <Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
    dst-port="LT_LIST"
    src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="LT_LIST"/>
  <Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1"
    dst-port="EMPTY_DPB"
    src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="EMPTY_DPB"/>
  <Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1"
    dst-port="ST_LIST"
    src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="ST_LIST"/>
  <Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1"
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  dst-port="LT_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="LT_LIST"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1"
  dst-port="ST_LIST_SZ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="ST_LIST_SZ"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum"
  dst-port="REF_IDX"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="REF_IDX_OUT"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum"
  dst-port="IS_NEW_MB"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
   src-port="IS_NEW_MB_SLICE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL1ToFrameNum"
  dst-port="REF_IDX"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr" src-port="REF_IDX_OUT"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL1ToFrameNum"
  dst-port="IS_NEW_MB"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
   src-port="IS_NEW_MB_SLICE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="COL_ZERO_FLAG"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer" src-port="COL_ZERO_FLAG"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
  dst-port="COL_ZERO_FLAG"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer" src-port="COL_ZERO_FLAG"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="TEMPORAL_PRED_INFO"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
   src-port="TEMPORAL_PRED_INFO"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="DIRECT_PRED_LX_I"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
   src-port="DIRECT_PRED_LX_O"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
  dst-port="DIRECT_PRED_LX_I"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
   src-port="DIRECT_PRED_LX_O"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="MV"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
   src-port="MV_OUT_DBF"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="FRAME_L0"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum"
   src-port="READ_FRAME"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="LOCATION_L0"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="LOCATION"/>
```

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```
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="MV_L0"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="MV_OUT"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="LOCATION_L1"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr" src-port="LOCATION"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="MV_L1"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr" src-port="MV_OUT"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="FRAME_L1"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL1ToFrameNum"
   src-port="READ_FRAME"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="REF_IDX_L0"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="REF_IDX_OUT"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="REF_IDX_L1"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr" src-port="REF_IDX_OUT"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="DIRECT_PRED_L0"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
   src-port="DIRECT_PRED_LX_0"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="DIRECT_PRED_L1"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
   src-port="DIRECT_PRED_LX_0"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
  dst-port="READ_FRAME"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX" src-port="READ_FRAME"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
  dst-port="MV"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX" src-port="MV"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
  dst-port="REF_IDX"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX" src-port="REF_IDX"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
  dst-port="SELECT_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX" src-port="SELECT_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="REF_IDX"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
   src-port="REF_IDX_TAB"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectRefIdx"
  dst-port="READ_FRAME_L0"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum"
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```
    src-port="READ_FRAME"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectRefIdx"
  dst-port="IS_NEW_MB_L0"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
    src-port="IS_NEW_MB_PIC"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectRefIdx"
  dst-port="READ_FRAME_L1"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL1ToFrameNum"
    src-port="READ_FRAME"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectRefIdx"
  dst-port="IS_NEW_MB_L1"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
    src-port="IS_NEW_MB_PIC"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectRefIdx"
  dst-port="SELECT_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX" src-port="SELECT_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
  dst-port="TEMPORAL_PRED_INFO"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
    src-port="TEMPORAL_PRED_INFO"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_GeneratePredWeight"
  dst-port="POC_LISTX"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_FrameNumToPocList"
    src-port="POC_LISTX"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_GeneratePredWeight"
  dst-port="POC_IS_LT"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_FrameNumToPocList"
    src-port="POC_IS_LT"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_GeneratePredWeight"
  dst-port="IS_NEW_MB_L1"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
    src-port="IS_NEW_MB_SLICE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_GeneratePredWeight"
  dst-port="REF_IDX_L1"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr" src-port="REF_IDX_OUT"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_GeneratePredWeight"
  dst-port="IS_NEW_MB_L0"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
    src-port="IS_NEW_MB_SLICE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_GeneratePredWeight"
  dst-port="REF_IDX_L0"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr" src-port="REF_IDX_OUT"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_GeneratePredWeight"
  dst-port="SELECT_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX" src-port="SELECT_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_Mgnt_InterPred"
  dst-port="MV"
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  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX" src-port="MV"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_Mgnt_InterPred"
  dst-port="PARTSZ"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord" src-port="PARTSZ"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_Mgnt_InterPred"
  dst-port="LOCATION"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX" src-port="LOCATION"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="READ_FRAME"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
   src-port="READ_FRAME_DBF"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="MV"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
   src-port="MV_OUT_DBF"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL0ToFrameNum"
  dst-port="REF_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0" src-port="REF_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="REF_LIST0"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0" src-port="REF_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_FrameNumToPocList"
  dst-port="REF_LIST0"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0" src-port="REF_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_RefIdxL1ToFrameNum"
  dst-port="REF_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1" src-port="REF_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="REF_LIST1"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1" src-port="REF_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_FrameNumToPocList"
  dst-port="REF_LIST1"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1" src-port="REF_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="DEL_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="DEL_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_FrameNumToPocList"
  dst-port="DEL_LIST"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="DEL_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="LT"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="LT_LIST"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_FrameNumToPocList"
  dst-port="LT"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="LT_LIST"/>
<Connection
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  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="EMPTY_DPB"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="EMPTY_DPB"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_FrameNumToPocList"
  dst-port="EMPTY_DPB"
  src="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO" src-port="EMPTY_DPB"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_FrameNumToPocList"
  dst-port="MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="SUB_MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvComponentReord"
  dst-port="SUB_MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
  dst-port="SUB_MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="SUB_MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_SelectMvLX"
  dst-port="SUB_MB_TYPE" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_TYPE"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="MB_PRED_MVD" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_PRED_MVD_l0"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="SUB_MB_PRED_MVD" src="AVCDecoder_Syn_Parser_Algo_Synp"
   src-port="SUB_MB_PRED_MVD_l0"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="SUB_MB_PRED_REF_IDX"
  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_PRED_REF_IDX_l0"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="MB_PRED_REF_IDX" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_PRED_REF_IDX_l0"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
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  dst-port="REF_TYPE_LIST" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="REF_TYPE_l0"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
  dst-port="MAX_FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MAX_FRAME_NUM"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
  dst-port="MAX_FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MAX_FRAME_NUM"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1"
  dst-port="MAX_FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MAX_FRAME_NUM"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
  dst-port="MMCO" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MMCO"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
  dst-port="NB_REF_FRAME" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="NB_REF_FRAME_l0"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
  dst-port="REF_REORDERING" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="REF_REORDERING_l0"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
  dst-port="FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="FRAME_NUM"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
  dst-port="FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="FRAME_NUM"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1"
  dst-port="FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="FRAME_NUM"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="FRAME_NUM"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_FrameNumToPocList"
  dst-port="FRAME_NUM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="FRAME_NUM"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
  dst-port="POC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="POC"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList0"
  dst-port="POC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="POC"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1"
  dst-port="POC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="POC"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="POC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="POC"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_FrameNumToPocList"
  dst-port="POC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="POC"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="MB_LOCATION" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_LOCATION"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MMCO"
  dst-port="NUM_REF_FRAME" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="NUM_REF_FRAMES"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="QP_Y" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="QP_Cb" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP_Cb"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="QP_Cr" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="QP_Cr"/>
```

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```
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="SLICE_DBF_PARAM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SLICE_DBF_PARAM"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MgntDeblockingFilter"
  dst-port="CBP_BLK" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="CBP_BLK"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL0_Reconstr"
  dst-port="DIRECT_SPATIAL_MV_FLAG"
  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="DIRECT_SPATIAL_MV_PRED_FLAG"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
  dst-port="DIRECT_SPATIAL_MV_FLAG"
  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="DIRECT_SPATIAL_MV_PRED_FLAG"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="DIRECT_SPATIAL_MV_FLAG"
  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="DIRECT_SPATIAL_MV_PRED_FLAG"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1"
  dst-port="REF_REORDERING" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="REF_REORDERING_l1"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1"
  dst-port="REF_TYPE_LIST" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="REF_TYPE_l1"/>
<Connection dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_RefList1"
  dst-port="NB_REF_FRAME" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="NB_REF_FRAME_l1"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
  dst-port="MB_PRED_REF_IDX" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_PRED_REF_IDX_l1"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
  dst-port="MB_PRED_MVD" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="MB_PRED_MVD_l1"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
  dst-port="SUB_MB_PRED_REF_IDX"
  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="SUB_MB_PRED_REF_IDX_l1"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvL1_Reconstr"
  dst-port="SUB_MB_PRED_MVD" src="AVCDecoder_Syn_Parser_Algo_Synp"
   src-port="SUB_MB_PRED_MVD_l1"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_MvBuffer"
  dst-port="DIRECT8x8_INFERENCE_FLAG"
  src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="DIRECT_8X8_INTERFERENCE_FLAG"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_GeneratePredWeight"
  dst-port="WP_PRED_IDC" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="WEIGHTED_PRED_IDC"/>
<Connection
  dst="AVCDecoder_Syn_Parser_Generate_Inter_Info_MVReconstruct_GeneratePredWeight"
  dst-port="WP_PARAM" src="AVCDecoder_Syn_Parser_Algo_Synp" src-port="WP_PARAM"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter"
  dst-port="MB_IN" src="AVCDecoder_Decoding_Y_PredictionY_Select" src-port="OUT"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Select"
  dst-port="SELECT"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="SELECT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Add_Clip"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16" src-port="MPR"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16"
```

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```
    dst-port="AVAIL"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16" src-port="AVAIL"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16"
    dst-port="Y_LEFT"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16" src-port="Y_LEFT"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16"
    dst-port="Y_UP"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16" src-port="Y_UP"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16"
    dst-port="Y_UP_LEFT"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16" src-port="Y_UP_LEFT"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16"
    dst-port="EDGE"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Buffer_Neighbour_FullMb" src-port="EDGE"/>
  <Connection dst="AVCDecoder_Decoding_Y_PredictionY_Select"
    dst-port="IN_2"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Add_Clip" src-port="Z"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Add_Clip"
    dst-port="Y"
    src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="COEF_ACR_INTRA16"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Algo_IntraPred_LUMA_16x16"
    dst-port="PRED_MODE"
    src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="PRED_MODE16"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Buffer_Neighbour_FullMb"
    dst-port="MB_IN" src="AVCDecoder_Decoding_Y_PredictionY_Select" src-port="OUT"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_16x16_Mgnt_Intra_16x16"
    dst-port="NEIGHBOUR"
    src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="NEIGHBOUR16"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4"
    dst-port="Y_LEFT"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4" src-port="Y_LEFT4"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4"
    dst-port="Y_UP"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4" src-port="Y_UP4"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4"
    dst-port="Y_UP_LEFT"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4" src-port="Y_UP_LEFT4"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Add_4x4"
    dst-port="X"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4" src-port="MPR"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4"
    dst-port="AVAIL"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4" src-port="AVAIL"/>
  <Connection
    dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Merge_4x4_to_16x16_norasterscan"
    dst-port="X"
    src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Add_4x4" src-port="Z"/>
```

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```
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Add_4x4"
  dst-port="Y"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Split_16x16_to_4x4_norasterscan" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_IntraPred_LUMA_4x4"
  dst-port="PRED_MODE"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4" src-port="PRED_MODE4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4"
  dst-port="EDGE"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Buffer_Neighbour_4x4" src-port="EDGE"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4"
  dst-port="MB_4X4"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Add_4x4" src-port="Z"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Select"
  dst-port="IN_1"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Merge_4x4_to_16x16_norasterscan" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Algo_Split_16x16_to_4x4_norasterscan"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="COEF_ACR_INTRA4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4"
  dst-port="PRED_MODE"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="PRED_MODE4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Buffer_Neighbour_4x4"
  dst-port="MB_IN" src="AVCDecoder_Decoding_Y_PredictionY_Select" src-port="OUT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_4x4_Mgnt_Intra4x4"
  dst-port="NEIGHBOUR"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="NEIGHBOUR4"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Add_Clip"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_Reord" src-port="MBPRED"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_Reord"
  dst-port="INTERP"
  src="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_SeparableSixTapQuarterPelAVC"
   src-port="INTERP"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Select"
  dst-port="IN_3"
  src="AVCDecoder_Decoding_Y_PredictionY_Inter_Add_Clip" src-port="Z"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Add_Clip"
  dst-port="Y"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="COEF_ACR_INTER"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_Add_8x8"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_IntraPred_LUMA_8x8" src-port="MPR"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_IntraPred_LUMA_8x8"
  dst-port="AVAIL"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Mgnt_Intra8x8" src-port="AVAIL"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_Merge_8x8_to_16x16_norasterscan"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_Add_8x8" src-port="Z"/>
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<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Mgnt_Intra8x8"
  dst-port="EDGE"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Buffer_Neighbour_8x8" src-port="EDGE"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Mgnt_Intra8x8"
  dst-port="MB_8X8"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_Add_8x8" src-port="Z"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_IntraPred_LUMA_8x8"
  dst-port="Y_LEFT"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Mgnt_Intra8x8" src-port="Y_LEFT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_IntraPred_LUMA_8x8"
  dst-port="Y_UP"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Mgnt_Intra8x8" src-port="Y_UP"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_IntraPred_LUMA_8x8"
  dst-port="Y_UP_LEFT"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Mgnt_Intra8x8" src-port="Y_UP_LEFT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_IntraPred_LUMA_8x8"
  dst-port="Y_UP_RIGHT"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Mgnt_Intra8x8" src-port="Y_UP_RIGHT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_IntraPred_LUMA_8x8"
  dst-port="PRED_MODE"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Mgnt_Intra8x8" src-port="PRED_MODE8"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_Add_8x8"
  dst-port="Y"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_Split_16x16_to_8x8_norasterscan" src-port="Y"/>
<Connection dst="AVCDecoder_Decoding_Y_PredictionY_Select"
  dst-port="IN_4"
  src="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_Merge_8x8_to_16x16_norasterscan" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Algo_Split_16x16_to_8x8_norasterscan"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="COEF_ACR_INTRA8"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Mgnt_Intra8x8"
  dst-port="PRED_MODE"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="PRED_MODE8"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Buffer_Neighbour_8x8"
  dst-port="MB_IN" src="AVCDecoder_Decoding_Y_PredictionY_Select" src-port="OUT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Intra_8x8_Mgnt_Intra8x8"
  dst-port="NEIGHBOUR"
  src="AVCDecoder_Decoding_Y_PredictionY_DemuxParserInfos" src-port="NEIGHBOUR8"/>
<Connection dst="AVCDecoder_Decoding_Y_DecodedPictureBuffer"
  dst-port="WD"
  src="AVCDecoder_Decoding_Y_PredictionY_Deblocking_Filter" src-port="MB_OUT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_PredictionY_Inter_Algo_Interp_SeparableSixTapQuarterPelAVC"
  dst-port="RD" src="AVCDecoder_Decoding_Y_DecodedPictureBuffer" src-port="RD"/>
<Connection dst="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_mux"
  dst-port="COEF_AC_4x4"
  src="AVCDecoder_Decoding_Y_ResidualY_Algo_Merge_4x4_to_16x16" src-port="Y"/>
<Connection dst="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_mux"
```

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  dst-port="COEF_AC_8x8"
  src="AVCDecoder_Decoding_Y_ResidualY_Algo_Merge_8x8_to_16x16" src-port="Y"/>
<Connection dst="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_mux"
  dst-port="TRANSFORM_SIZE_8x8_FLAG"
  src="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_demux" src-port="TRANSFORM_SIZE_8x8_FLAG_O"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_IHT1d_0"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_IS_Zigzag_4x4_DC" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_0"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_IHT1d_0" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_IHT1d_1"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_0" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Scaling"
  dst-port="I"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_IHT1d_1" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_1"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Scaling" src-port="O"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Reordering"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DC_Transpose4x4_1" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Scaling"
  dst-port="QP"
  src="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_demux" src-port="QP_4x4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Scaling"
  dst-port="MB_TYPE"
  src="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_demux" src-port="MB_TYPE_4x4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Scaling"
  dst-port="SCALING_LIST"
  src="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_demux" src-port="SCALING_LIST_4x4"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Mgnt_IQ_INTRA16x16"
  dst-port="COEF_AC"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IS_Zigzag_4x4_AC" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
  dst-port="IN"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Mgnt_IQ_INTRA16x16" src-port="O"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
  dst-port="IS_DC"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Mgnt_IQ_INTRA16x16" src-port="IS_DC"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_Transpose4x4_0"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_1d_0" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_1d_1"
  dst-port="X"
```

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```
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_Transpose4x4_0" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_Transpose4x4_1"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_IT4x4_Algo_IT4x4_1d_1" src-port="Y"/>
<Connection
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  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_Algo_IQ_QSAndSLAndIDCTScaler_4x4"
   src-port="OUT"/>
<Connection
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<Connection
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  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_demux" src-port="COEF_AC_4x4"/>
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  dst-port="QP"
  src="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_demux" src-port="QP_4x4"/>
<Connection
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  src="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_demux" src-port="MB_TYPE_4x4"/>
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  src="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_demux" src-port="MB_TYPE_4x4"/>
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<Connection
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  src="AVCDecoder_Decoding_Y_ResidualY_FUN_dcr_Algo_DCR_Hadamard_LUMA_Reordering" src-port="Y"/>
<Connection
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  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_8x8_Algo_IS_Zigzag_8x8_AC" src-port="Y"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_8x8_Algo_ICT_IntraPred_8x8"
  dst-port="X"
  src="AVCDecoder_Decoding_Y_ResidualY_FUN_IS_IQ_IT_L_8x8_Algo_IQ_QSAndSLAndIDCTScaler_8x8"
   src-port="OUT"/>
<Connection
  dst="AVCDecoder_Decoding_Y_ResidualY_Algo_Merge_8x8_to_16x16"
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<Connection
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  src="AVCDecoder_Decoding_Y_ResidualY_I4x4_I8x8_demux" src-port="COEF_AC_8x8"/>
<Connection
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