

ISO/IEC 14496-33:2019 (E)

Information technology — Coding of audio-visual objects — Part 33: Internet video coding

Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms and definitions
4	Abbreviations
5	Conventions
5.1	Arithmetic operators
5.2	Logical operators
5.3	Relational operators
5.4	Bitwise operators
5.5	Assignment
5.6	Order of operation precedence
5.7	Mathematical functions
5.8	Variables, syntax elements and tables
5.9	Text description of logical operations
5.10	Processes
5.11	Description of bitstream syntax parsing process and decoding process
5.11.1	Method of describing bitstream syntax
5.11.2	Syntax functions
5.11.3	Syntax descriptors
5.11.4	Reserved, forbidden and marker bit
6	Source, coded, decoded and output data formats
6.1	Source
6.2	Colour format
6.3	Coded bitstream format
6.4	Sequence header
6.5	Frame
6.6	Frame types
6.7	Slice
6.8	Macroblock
6.9	Block
6.10	Frame re-ordering
6.11	Reference frames
6.12	Inverse scanning processes and derivation processes for neighbours
6.12.1	General
6.12.2	Inverse macroblock scanning process
6.12.3	Inverse macroblock partition scanning process
6.12.4	Inverse 8x8 luma block scanning process
6.12.5	Inverse 4x4 luma block scanning process
6.12.6	Derivation process of the availability for macroblock addresses
6.12.7	Derivation process for neighbouring macroblock addresses and their availability
6.12.8	Derivation processes for neighbouring macroblocks, blocks, and partitions
6.12.8.1	General
6.12.8.2	Derivation process for neighbouring macroblocks
6.12.8.3	Derivation process for neighbouring 8x8 luma block

6.12.8.4	Derivation process for neighbouring partitions
6.12.9	Derivation process for neighbouring locations
7	Syntax and semantics
7.1	Bitstream syntax
7.1.1	Start codes
7.1.2	Video sequence
7.1.2.1	Sequence
7.1.2.2	Sequence header
7.1.2.3	User data
7.1.3	Frame
7.1.3.1	I Frame header
7.1.3.2	PB Frame header
7.1.4	Slice
7.1.5	Macroblock
7.1.5.1	General
7.1.5.2	Coded block pattern
7.1.6	Block
7.2	Video bitstream semantics
7.2.1	Start code
7.2.2	Video sequence
7.2.2.1	Sequence header
7.2.2.2	User_data
7.2.3	Frame
7.2.3.1	I Frame header
7.2.3.2	PB frame header
7.2.4	Slice
7.2.5	Macroblock
7.2.5.1	General
7.2.5.2	Coded block pattern
7.2.6	Block
8	Decoding process
8.1	General
8.2	Intra prediction
8.2.1	General
8.2.2	Intra_4x4 prediction process for luma samples
8.2.2.1	General
8.2.2.2	Derivation process for the Intra4x4PredMode
8.2.2.3	Intra_4x4 sample prediction
8.2.2.3.1	General
8.2.2.3.2	Reference sample calculation
8.2.2.3.3	Specification of 4x4 Intra_Vertical prediction mode
8.2.2.3.4	Specification of 4x4 Intra_Horizontal prediction mode
8.2.2.3.5	Specification of 4x4 Intra_DC prediction mode
8.2.2.3.6	Specification of 4x4 Intra_Down_Left mode
8.2.2.3.7	Specification of 4x4 Intra_Down_Right mode
8.2.3	Intra_8x8 prediction process for luma samples
8.2.3.1	General
8.2.3.2	Derivation process for the Intra8x8PredMode
8.2.3.3	Intra_8x8 sample prediction
8.2.3.3.1	General
8.2.3.3.2	Reference sample calculation
8.2.3.3.3	Specification of 8x8 Intra_Vertical prediction mode
8.2.3.3.4	Specification of 8x8 Intra_Horizontal prediction mode
8.2.3.3.5	Specification of 8x8 Intra_DC prediction mode
8.2.3.3.6	Specification of 8x8 Intra_Down_Left mode
8.2.3.3.7	Specification of 8x8 Intra_Down_Right mode
8.2.4	Intra_16x16 prediction process for luma samples
8.2.4.1	General
8.2.4.2	Reference sample calculation
8.2.4.2.1	General
8.2.4.2.2	Specification of 16x16 Intra_Vertical prediction mode
8.2.4.2.3	Specification of 16x16 Intra_Horizontal prediction mode

- 8.2.4.2.4 Specification of 16x16 Intra_DC prediction mode
- 8.2.4.2.5 Specification of 16x16 Intra_Down_Left mode
- 8.2.4.2.6 Specification of 16x16 Intra_Down_Right mode
- 8.2.5 Intra prediction for 8x8 chroma block
 - 8.2.5.1 General
 - 8.2.5.2 Reference sample calculation
 - 8.2.5.3 Specification of Intra_Chroma_DC prediction mode
 - 8.2.5.4 Specification of Intra_Chroma_Horizontal prediction mode
 - 8.2.5.5 Specification of Intra_Chroma_Vertical prediction mode
 - 8.2.5.6 Specification of Intra_Chroma_Plane prediction mode
- 8.3 Inter prediction
 - 8.3.1 General
 - 8.3.2 Derivation process for motion vector components and reference indices
 - 8.3.2.1 General
 - 8.3.2.2 Derivation process for luma motion vectors for skipped macroblock in P frame
 - 8.3.2.3 Derivation process for luma motion vectors for B_Skip
 - 8.3.2.4 Derivation process for luma motion vectors for B_Sym
 - 8.3.2.5 Derivation process for luma motion vectors for P_Mh
 - 8.3.2.6 Derivation process for luma motion vector prediction
 - 8.3.2.7 Derivation process for luma motion vectors
 - 8.3.2.8 Derivation process for chroma motion vectors
 - 8.3.3 Decoding process for inter prediction samples
 - 8.3.3.1 General
 - 8.3.3.2 Reference frame selection process
 - 8.3.3.3 Fractional sample interpolation process
 - 8.3.3.3.1 General
 - 8.3.3.3.2 Luma sample interpolation process
 - 8.3.3.3.3 Chroma sample interpolation process
 - 8.3.3.4 Combining predictions
- 8.4 Transform coefficient decoding process and frame reconstruction process
 - 8.4.1 General
 - 8.4.2 Inverse scanning
 - 8.4.3 Inverse quantization
 - 8.4.3.1 Quantization parameter
 - 8.4.3.2 Inverse quantization process
 - 8.4.4 Inverse transform process
 - 8.4.4.1 Inverse transform for 4x4 block
 - 8.4.4.2 Inverse transform for 8x8 block
 - 8.4.4.3 Inverse transform for 16x16 block
 - 8.4.5 Reconstruction
- 8.5 Loop filtering
- 8.6 Reference frame buffer management

9 Parsing process

- 9.1 General
- 9.2 $ue(v)$
- 9.3 Parsing process for transform coefficient levels
- 9.4 $ae(v)$
 - 9.4.1 General
 - 9.4.2 Description
 - 9.4.3 Initialization
 - 9.4.3.1 Initialization of context model
 - 9.4.3.2 Initialization of advanced entropy coding decoder
 - 9.4.4 Binarization process
 - 9.4.5 Parsing binary string
 - 9.4.5.1 Description
 - 9.4.5.2 Determine ctxldx
 - 9.4.5.3 Parsing bins
 - 9.4.5.3.1 Parsing process
 - 9.4.5.3.2 `decode_decision`
 - 9.4.5.3.3 `decode_bypass`
 - 9.4.5.3.4 `decode_aec_stuffing_bit`
 - 9.4.5.3.5 `update_ctx`

10	Profiles and levels
10.1	General
10.2	Profiles
10.3	Levels

Page count: 98