INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.222.0

Amendment 5
(01/2005)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Transmission multiplexing and synchronization

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Information technology – Generic coding of moving pictures and associated audio information: Systems

Amendment 5: New audio profile and level signalling and change to audio_type table entry

ITU-T Recommendation H.222.0 (2000) – Amendment 5

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INTERNATIONAL STANDARD ISO/IEC 13818-1
ITU-T RECOMMENDATION H.222.0

Information technology – Generic coding of moving pictures and associated audio information: Systems

Amendment 5

New audio profile and level signalling and change to audio_type table entry

Summary

The major element in this amendment is the signalling of bandwidth extension data to MPEG-AAC audio ("AAC-plus"), which was implemented as follows:

1) A new descriptor called "MPEG-2_AAC_audio_descriptor" has been added to signal AAC specific audio parameters in the PMT including the use of bandwidth extension data to MPEG-2 AAC.
2) The MPEG-4_audio_profile_and_level table has been replaced by a newer table to include the bandwidth extension data to MPEG-4 audio.
3) In the ISO_639_language_descriptor, the values for audio_type 0x04-0x7F have been changed from 'reserved' to 'user_private'. This change was done at the request of broadcasters to enable signalling ancillary audio as this could not be done earlier because all the values of audio_type (0x04-0xFF) were reserved.

Source

Amendment 5 to ITU-T Recommendation H.222.0 (2000) was approved on 8 January 2005 by ITU-T Study Group 16 (2005-2008) under the ITU-T Recommendation A.8 procedure. An identical text is also published as ISO/IEC 13818-1, Amendment 5.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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New audio profile and level signalling and change to audio_type table entry

1) Subclause 2.6.2

Replace Table 2-39 by the following table (with the changes underlined):

Table 2-39 – Program and program element descriptors

descriptor_tag	TS	PS	Identification
0	n/a	n/a	Reserved
1	n/a	n/a	Reserved
2	X	X	video_stream_descriptor
3	X	X	audio_stream_descriptor
4	X	X	hierarchy_descriptor
5	X	X	registration_descriptor
6	X	X	data_stream_alignment_descriptor
7	X	X	target_background_grid_descriptor
8	X	X	Video_window_descriptor
9	X	X	CA_descriptor
10	X	X	ISO_639_language_descriptor
11	X	X	System_clock_descriptor
12	X	X	Multiplex_buffer_utilization_descriptor
13	X	X	Copyright_descriptor
14	X		Maximum_bitrate_descriptor
15	X	X	Private_data_indicator_descriptor
16	X	X	Smoothing_buffer_descriptor
17	X		STD_descriptor
18	X	X	IBP_descriptor
19-26	X		Defined in ISO/IEC 13818-6
27	X	X	MPEG-4_video_descriptor
28	X	X	MPEG-4_audio_descriptor
29	X	X	IOD_descriptor
30	X		SL_descriptor
31	X	X	FMC_descriptor
32	X	X	External_ES_ID_descriptor
33	X	X	MuxCode_descriptor
34	X	X	FmxBufferSize_descriptor
35	X		MultiplexBuffer_descriptor
36	X	X	Content_labeling_descriptor

Table 2-39 – Program and program element descriptors

descriptor_tag	TS	PS	Identification
37	X	X	Metadata_pointer_descriptor
38	X	X	Metadata_descriptor
39	X	X	Metadata_STD_descriptor
40	X	X	AVC video descriptor
41	X	X	IPMP_descriptor (defined in ISO/IEC 13818-11, MPEG-2 IPMP)
42	X	X	AVC timing and HRD descriptor
43	X	X	MPEG-2_AAC_audio_descriptor
44-63	n/a	n/a	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 Reserved
64-255	n/a	n/a	User Private

2) Subclause 2.6.19

Replace Table 2-53 by the following (with the changes underlined):

Table 2-53 – Audio type values

Value	Description
0x00	Undefined
0x01	Clean effects
0x02	Hearing impaired
0x03	Visual impaired commentary
0x04-0x7F	User Private
0x80-0xFF	Reserved

3) Subclause 2.6.40

Replace Table 2-62, MPEG-4_audio_profile_and_level assignment values, by the following table (with the changes underlined):

Table 2-62 – MPEG-4_audio_profile_and_level assignment values

Value	Description
0x00-0x0F	Reserved
0x10	Main profile, level 1
0x11	Main profile, level 2
0x12	Main profile, level 3
0x13	Main profile, level 4
0x14-0x17	Reserved
0x18	Scalable Profile, level 1
0x19	Scalable Profile, level 2
0x1A	Scalable Profile, level 3
0x1B	Scalable Profile, level 4
0x1C-0x1F	Reserved

Table 2-62 – MPEG-4_audio_profile_and_level assignment values

Value	Description
0x20	Speech profile, level 1
0x21	Speech profile, level 2
0x22-0x27	Reserved
0x28	Synthesis profile, level 1
0x29	Synthesis profile, level 2
0x2A	Synthesis profile, level 3
0x2B-0x2F	Reserved
0x30	High quality audio profile, level 1
0x31	High quality audio profile, level 2
0x32	High quality audio profile, level 3
0x33	High quality audio profile, level 4
0x34	High quality audio profile, level 5
0x35	High quality audio profile, level 6
0x36	High quality audio profile, level 7
0x37	High quality audio profile, level 8
0x38	Low delay audio profile, level 1
0x39	Low delay audio profile, level 2
0x3A	Low delay audio profile, level 3
0x3B	Low delay audio profile, level 4
0x3C	Low delay audio profile, level 5
0x3D	Low delay audio profile, level 6
0x3E	Low delay audio profile, level 7
0x3F	Low delay audio profile, level 8
0x40	Natural audio profile, level 1
0x41	Natural audio profile, level 2
0x42	Natural audio profile, level 3
0x43	Natural audio profile, level 4
0x44-0x47	Reserved
0x48	Mobile audio internetworking profile, level 1
0x49	Mobile audio internetworking profile, level 2
0x4A	Mobile audio internetworking profile, level 3
0x4B	Mobile audio internetworking profile, level 4
0x4C	Mobile audio internetworking profile, level 5
0x4D	Mobile audio internetworking profile, level 6
0x4E-0x4F	Reserved
0x50	AAC profile, level 1
0x51	AAC profile, level 2
0x52	AAC profile, level 4
0x53	AAC profile, level 5
0x54-0x57	Reserved
0x58	High efficiency AAC profile, level 2
0x59	High efficiency AAC profile, level 3
0x5A	High efficiency AAC profile, level 4
0x5B	High efficiency AAC profile, level 5
0x5C-0xFF	Reserved

4) Subclause 2.6.67

Add the following after subclause 2.6.67:

2.6.68 MPEG-2 AAC audio descriptor

For individual ISO/IEC 13818-7 streams directly carried in PES packets, the MPEG-2 AAC audio descriptor defined in Table Amd.5-1 provides basic information for identifying the coding parameters of such audio elementary streams.

Table Amd.5-1 – MPEG-2 AAC_audio_descriptor

Syntax	No. of bits	Mnemonic
MPEG-2_AAC_audio_descriptor () {		
descriptor_tag	**8**	**uimsbf**
descriptor_length	**8**	**uimsbf**
MPEG-2_AAC_profile	**8**	**uimsbf**
MPEG-2_AAC_channel_configuration	**8**	**uimsbf**
MPEG-2_AAC_additional_information	**8**	**uimsbf**
}		

Semantics of fields in MPEG-2 AAC audio descriptor

MPEG-2_AAC_profile – This 8-bit field indicates the AAC profile according to the index in ISO/IEC 13818-7:2004 subclause 7.1 Table 31.

MPEG-2_AAC_channel_configuration – This 8-bit field indicates the number and configuration of audio channels presented to the listener by the AAC decoder for the specified program. Values in the range from 1 to 6 indicate number and configuration of audio channels as given for "Default bitstream index number" in ISO/IEC 13818-7:2004 subclause 8.9 Table 42. All other values indicate that the number and configuration of audio channels is undefined.

MPEG-2_AAC_additional_information – This 8-bit field indicates whether or not bandwidth extension data as defined in ISO/IEC 13818-7:2004 is embedded in the AAC bitstream according to Table Amd.5-2.

Table Amd.5-2 – MPEG-2_AAC_additional_information field values

Value	Description
0x00	AAC data according to ISO/IEC 13818-7:2004
0x01	AAC data with Bandwidth Extension data present according to ISO/IEC 13818-7:2004
0x02-0xFF	Reserved

5) Subclause 2.11.2.1

Replace the following text (with the changes underlined):

In case of an ISO/IEC 14496-3 elementary stream, before PES packetization the elementary stream data shall be first encapsulated in the LATM transport syntax defined in ISO/IEC 14496-3 / Amd.1. If a PTS is present in the PES packet header it shall refer to the first audio frame that follows the first syncword that commences in the payload of the PES packet.

to:

In case of an ISO/IEC 14496-3 elementary stream, before PES packetization the elementary stream data shall be first encapsulated in the LATM/LOAS AudioSyncStream() transport syntax defined in ISO/IEC 14496-3:2001 subclause 1.7.2. If a PTS is present in the PES packet header, it shall refer to the first audio frame that follows the first syncword that commences in the payload of the PES packet.

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