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Information technology — Generic coding of moving pictures and associated audio information —

Part 6:
Extensions for DSM-CC

AMENDMENT 2: Additions to support synchronized download services, opportunistic data services and resource announcement in broadcast and interactive services

Technologies de l'information — Codage générique des images animées et des informations sonores associées —

Partie 6: Extensions pour DSM-CC

AMENDEMENT 2: Ajouts pour supporter les services de téléchargement vers l'aval synchronisés, les services de données opportunistes et les annonces de ressources dans les services de diffusion et interactifs

Reference number
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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this Amendment may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

Amendment 2 to International Standard ISO/IEC 13818-6:1998 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

Information technology — Generic coding of moving pictures and associated audio information —

Part 6:
Extensions for DSM-CC

AMENDMENT 2: Additions to support synchronized download services, opportunistic data services and resource announcement in broadcast and interactive services

1) Replace Table 2-5 with the following table:

"

Table 2-5 DSM-CC adaptationTypes

Adaptation Type	Description
0x00	ISO/IEC 13818-6 Reserved.
0x01	DSM-CC Conditional Access adaptation format.
0x02	DSM-CC User ID adaptation format.
0x03	ISO/IEC 13818-6 Reserved.
0x04	DSM-CC Synchronized Download Protocol adaptation format.
0x05-0x7F	ISO/IEC 13818-6 Reserved.
0x80-0xFF	User Defined adaptation type.

"

2) Add the new subclause 2.1.4:

"

2.1.4 DSM-CC Synchronized Download Protocol Adaptation Format

Table 2.9 indicates the format of the DSM-CC Synchronized Download protocol adaptation fields.

Table 2-9 DSM-CC Synchronized Download Protocol Adaptation Format

Syntax	Num. of bits
dsmccSynchronizedDownloadProtocol	
{	
reserved	**16**
'0010'	**4**
PTS [32..30]	**3**
marker_bit	**1**
PTS [29..15]	**15**
marker_bit	**1**
PTS [14..0]	**15**
marker_bit	**1**
}	

The **reserved** field is ISO/IEC 13818-6 reserved.

marker_bit – This 1-bit field shall be set to “1”.

PTS - The PTS is a 33-bit number coded in three separate fields as defined in ITU-T Rec. H.222.0 | ISO/IEC 13818-1. This field shall refer to the first access unit commencing in the data module.

"

3) At the end of subclause 7.1, add the following text:

"

The Synchronized Download protocol may be used to support the delivery to Clients of non-streaming data modules synchronized with another program element. The Synchronized Download protocol shall only be applicable to a non-flow controlled scenario in an MPEG-2 Transport Stream. The synchronization is achieved by the inclusion of an ITU-T Rec. H.222.0 | ISO/IEC 13818-1 Presentation Time Stamp into the adaptation header fields of the Download Data message header.

"

4) At the end of subclause 7.1.1, and before Figure 7-4, add the following text:

"

The Synchronized Download protocol shall be applicable only to Network Model 4.

"

5) Add the new subclause 9.2.8:

"

9.2.8 DSM-CC Synchronized Download Protocol

The following restrictions shall apply to the DSM-CC sections and the MPEG-2 Transport Stream packets encapsulating the DSM-CC Synchronized Download Protocol.

- The PTS field in the DSM-CC Synchronized Download Protocol shall be present only in the DSMCC_section conveying the first block of the data module (i.e., the section_number field of the DSMCC_section is equal to 0).
- No more than one DSMCC_section in which the DSM-CC Synchronized Download Protocol is encapsulated, shall start in any Transport Stream packet.
- The pointer field in MPEG-2 Transport Stream packets conveying the start of a DSMCC_section in which the DSM-CC Synchronized Download Protocol is encapsulated, shall be equal to 0.

"

6) Replace Table 9-4 with the following table:

"

Table 9-4 DSM-CC Stream Types

stream_type	Description
0x00-0x09	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 defined
0x0A	Multi-protocol Encapsulation
0x0B	DSM-CC U-N Messages
0x0C	DSM-CC Stream Descriptors
0x0D	DSM-CC Sections (any type, including private data)
0x0E - 0x13	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 reserved
0x14	DSM-CC Synchronized Download Protocol
0x15 - 0x7F	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 reserved
0x80 - 0xFF	User private

"

7) Add the following to the end of itemized list in subclause 9.2.3 "DSM-CC Stream Types"

"

- Only DSMCC_sections with table_id 0x3B or 0x3C shall be contained within Transport Stream packets of stream_type 0x14.

"

8) Replace Table 2-2 with the following table:

"

Table 2-2 MPEG-2 DSM-CC dsmccType values

dsmccType	Description
0x00	ISO/IEC 13818-6 Reserved
0x01	Identifies the message as an ISO/IEC 13818-6 IS User-to-Network configuration message.
0x02	Identifies the message as an ISO/IEC 13818-6 IS User-to-Network session message.
0x03	Identifies the message as an ISO/IEC 13818-6 IS Download message.
0x04	Identifies the message as an ISO/IEC 13818-6 IS SDB Channel Change Protocol message.
0x05	Identifies the message as an ISO/IEC 13818-6 IS User-to-Network pass-thru message.
0x06	SMPTE 325M Opportunistic Flow Control Protocol
0x07-0x7F	ISO/IEC 13818-6 Reserved.
0x80-0xFF	User Defined message type.

"

9) After Table 2-2, add the following statement:

"

The SMPTE 325M Opportunistic Flow Control Protocol is used for communication between a data server and an MPEG-2 emission multiplexer in support of opportunistic data services. Opportunistic data services attempt to fill any bandwidth available in the emission multiplex with broadcast data on a nearly instantaneous basis. In such a situation, the SMPTE 325M Flow Control Protocol is used by the emission multiplexer to request data packets to the data server. Refer to SMPTE 325M for details.

"

10) Add the new subclauses 4.7.5.22, 4.7.5.23, 4.7.5.24, and 4.7.5.25:

"

4.7.5.22 Deferred MPEG Program Element Resource Descriptor definition

Announcement of a program element residing in another MPEG-2 Program within the current Transport Stream or in an MPEG-2 Transport Stream other than the current one (i.e., a remote MPEG-2 Transport Stream) is made possible by use of the **DeferredMpegProgramElement** resource descriptor. The **DeferredMpegProgramElement** descriptor allows Clients to locate a program element residing in another MPEG-2 Program within the current Transport Stream or in a remote Transport Stream. The PID of the program element in the other Program within the current Transport Stream or in the remote Transport Stream is referred to indirectly by means of the **associationTag** field in the **DeferredMpegProgramElement** descriptor. The use of an **associationTag** makes the descriptor binding independent of possible PID re-mapping that may occur during the end-to-end transmission of the Transport Stream.

Table 4-97 DeferredMpegProgramElement descriptor

Field Name	Encoding	Variable	Field Length In Bytes
originatorId	**s**	**No**	**2**
mpegTransportStreamId	**s**	**No**	**2**
mpegProgramNum	**s**	**No**	**2**
streamType	**s**	**No**	**1**
associationTag	**s**	**No**	**2**

originatorId – This field shall identify the source of the program element.

mpegTransportStreamId – This field shall identify the remote Transport Stream in which the program element resides as defined in ITU-T Rec. H.222.0 | ISO/IEC 13818-1.

mpegProgramNum – This field shall specify the program number of the program which contains the program element as defined in ITU-T Rec. H.222.0 | ISO/IEC 13818-1.

streamType – This field shall indicate the type of program element carried within the remote Transport Stream as defined in ITU-T Rec. H.222.0 | ISO/IEC 13818-1.

associationTag – This field shall specify the value of the association tag associated with the program element. The remote Program Map Table shall include an **association_tag_descriptor** (as defined in clause 11) to allow identification of the PID value (as defined in ITU-T Rec. H.222.0 | ISO/IEC 13818-1) assigned to the remote program element.

4.7.5.23 Internet Protocol Version 6 Resource Descriptor

The IPV6ResourceDescriptor is specified in Table 4-98. This descriptor shall be used to announce the presence of a communication channel supporting the Internet Protocol Version 6.

Table 4-98 IPV6 Resource Descriptor definition

Field Name	Encoding	Variable	Field Length In Bytes
sourceIpV6Address	**s**	**No**	**16**
sourceIpV6Port	**s**	**No**	**2**
destinationIpV6Address	**s**	**No**	**16**
destinationIpV6Port	**s**	**No**	**2**
ipV6Protocol	**s**	**No**	**2**

sourceIpV6Address – This 128-bit field shall specify the IP version 6 address of the device which is sending the IP messages. A value equal to 0 shall indicate that this is not a valid IP address.

sourceIpV6Port – This 16-bit field shall specify the port from which the data will be transmitted. The value 0xffff shall specify that the port number is unspecified.

destinationIpV6Address – This 128 bit field shall specify the IP version 6 address of the device to which the IP messages are sent.

destinationIpV6Port – This 16-bit field shall specify the port to which the data will be transmitted. The value 0xffff shall indicate that the port number is unspecified.

ipV6Protocol – This 16-bit field shall specify the protocol which is being carried over the IP stream. These are defined to be 0x0006 for TCP and 0x0017 for UDP.

The sourceIpV6Address, sourceIpV6Port, destinationIpV6Address and destinationIpV6Port fields are transmitted as network byte order.

4.7.5.24 URL Resource Descriptor

The URLResourceDescriptor is defined in Table 4-99. This descriptor is used to a URL string specified in accordance with IETF RFC 1738.

Table 4-99 URL Resource Descriptor definition

Field Name	Encoding	Variable	Field Length In Bytes
URL_length	**s**	**No**	**2**
URL_byte	**s**	**Var**	**URL_length**

URL_length – This 16-bit field shall specify the length in bytes of the URL string.

URL_byte – This 8-bit field shall represent a byte of the URL string.

4.7.5.25 DHCP Resource Descriptor

The DHCPResourceDescriptor is used for the transport of DHCP message types as defined in IETF RFC 2131.

Table 4-100 DHCP Resource Descriptor definition

Field Name	Encoding	Variable	Field Length In Bytes
DHCP_length	**s**	**No**	**2**
DHCP_byte	**s**	**Var**	**DHCP_length**

DHCP_length – This 16-bit field shall specify the length in bytes of the DHCP message payload.

DHCP_byte – This 8-bit field shall represent a byte of the DHCP message payload.

"

11) Replace Table 4-73 with the following table:

"

Table 4-73 DSM-CC User-to-Network resourceDescriptorTypes

resourceDescriptorType	Value	Description
Reserved	0x0000	ISO/IEC 13818-6 reserved.
ContinuousFeedSession	0x0001	Describes resources already allocated in a continuous feed session.
AtmConnection	0x0002	Describes either an ATM PVC, or a pre-allocated SVC, connection resource.
MpegProgram	0x0003	Provides a method of delivering the MPEG-2 Systems Program Map Table (PMT) information 'out of band'.
PhysicalChannel	0x0004	Indicates the use of a specific transport stream. (e.g. the tuner channels on a Hybrid Fiber Coax (HFC) system).
TSUpstreamBandwidth	0x0005	Describes the total upstream bandwidth in bits/second required to deliver session data from the Client to the Server.
TSDownstreamBandwidth	0x0006	Describes the downstream bandwidth in bits/second required to deliver session data from the Server to the Client.
AtmSvcConnection	0x0007	Provides ATM SVC SETUP parameters. This is used when the Network or Client is responsible for initiating a call.
ConnectionNotify	0x0008	This is sent between the User and the Network to indicate that a connection has been established outside of the scope of DSM-CC. This resource descriptor contains no fields and is used as a correlation between the session and the connection.