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Part 6: Extensions for DSM-CC

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Additions to support data broadcasting

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

Partie 6: Extensions pour DSM-CC

AMENDEMENT 1

Additions à la diffusion de soutien de données

Reference number
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Foreword

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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.

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Amendment 1 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 1: Additions to support data broadcasting

1) Replace the semantic definition of DownloadInfoIndication **moduleSize** *in subclause 7.3.2 with the following:*

"

The **moduleSize** field is the length, in bytes, of the described module. A value of zero indicates that the module size is not specified.

"

2) Replace the last paragraph in subclause 9.2.1 with the following:

"

MPEG-2 Systems, ISO/IEC 13818-1:2000, defines generic table section syntax that DSM-CC uses to provide re-assembly of Transport Stream packets into DSM-CC messages. This specification defines additional semantics on ISO/IEC 13818-1:2000 sections to support additional DSM-CC requirements. Called DSMCC_section and DSMCC_Addressable_section, the syntax is compatible with the generic section syntax so that compliant MPEG-2 Systems decoders may be used.

"

*3) In subclause 9.2.2, replace every occurrence of "*private_section" *with* "generic_section"

4) In subclause 9.2.2, replace every occurrence of "private_indicator" *with "*complement_indicator".

5) Replace Table 9-3 with the following:

"

Table 9-3 DSM-CC table_id assignments

table_id	DSMCC Section Type
0x00 - 0x37	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 defined
0x38 - 0x39	ISO/IEC 13818-6 reserved
0x3A	DSM-CC Sections containing multi-protocol encapsulated data
0x3B	DSM-CC Sections containing U-N Messages, except Download Data Messages
0x3C	DSM-CC Sections containing Download Data Messages
0x3D	DSM-CC Sections containing Stream Descriptors
0x3E	DSM-CC Sections containing private data
0x3F	DSM-CC Addressable Sections
0x40 - 0xFE	User private
0xFF	forbidden

"

6) In subclause 9.2.2.1 replace the corresponding paragraphs with the following:

"

version_number -- This field is a 5-bit field. If the value of the table_id field equals 0x3A or 0x3B, this field shall be set to zero. If the value of the table_id field equals 0x3C and a DownloadDataBlock Message is conveyed, this field shall have the value of the least significant 5 bits of the moduleVersion field of the conveyed DownloadDataBlock Message. If the value of the table_id field equals 0x3C and a DownloadDataRequest Message is conveyed, this

field shall be set to zero. If the value of table_id equals 0x3D, then this field shall be set as defined in ISO/IEC 13818-1:2000. If the value of the table_id field equals 0x3E, then the value and use of this field are defined by the user.

current_next_indicator -- This is a 1 bit flag. If the value of the table_id field equals 0x3A, 0x3B or 0x3C, this bit shall be set to '1'. Otherwise, this field shall be set as defined in ISO/IEC 13818-1:2000.

section_number -- This field is a 8-bit field. If the value of the table_id field equals 0x3A or 0x3B, this field shall be set to zero. If the value of the table_id field equals 0x3C, this field shall have a value of the least significant 8 bits of the blockNumber field of the conveyed DownloadDataBlock or DownloadDataRequest Message. If the value of the table_id field is not in the range of 0x3A to 0x3C, then this field shall be set as defined in ISO/IEC 13818-1:2000.

last_section_number -- This field is a 8-bit field. This field specifies the number of the last section (that is, the section with the highest section number) of the table of which this section is a part. (Note: This means that this field shall be set to the maximum value that is encoded in the section_number field for the same table_id, table_id_extension and version_number field).

"

7) Delete the footnote under Table 9-2.

8) Add the following to subclause 9.2.2.1 after last_section_number:

"

LLCSNAP() -- This structure shall contain the datagram according to the ISO/IEC 8802-2 Logical Link Control (LLC) and ISO/IEC 8802-1a SubNetwork Attachment Point (SNAP) specifications. For more information, see subclause 9.2.5, Encapsulation within MPEG-2 Transport Streams.

"

9) Add the following subclauses after subclause 9.2.2:

"

9.2.3 DSM-CC Addressable Sections

The DSMCC_addressable_section() format is used to send a DSM-CC encapsulated datagram to a specific device or group of devices. This format embeds the **deviceId** of the target device into the section header to allow address filtering at the section level. It also supports scrambling mechanisms.

The following table defines the format and semantics of the DSMCC_addressable_section:

Table 9-4 Addressable Sections

Syntax	No. of bits	Mnemonic
DSMCC_addressable_section() {		
table_id	**8**	**uimsbf**
'0'	**1**	
error_detection_type	**1**	**bslbf**
reserved	**2**	**bslbf**
addressable_section_length	**12**	**uimsbf**
deviceId[7..0]	**8**	**uimsbf**
deviceId[15..8]	**8**	**uimsbf**
reserved	**2**	**bslbf**
payload_scrambling_control	**2**	**bslbf**
address_scrambling_control	**2**	**bslbf**
LLCSNAP_flag	**1**	**bslbf**
'1'	**1**	
section_number	**8**	**uimsbf**
last_section_number	**8**	**uimsbf**
deviceId[23..16]	**8**	**uimsbf**
deviceId[31..24]	**8**	**uimsbf**
deviceId[39..32]	**8**	**uimsbf**

```
        deviceId[47..40]                        8       uimsbf
        if (LLCSNAP_flag == '1') {
                LLCSNAP()
        }
        else{
                for (j=0;j<N1;j++) {
                        datagram_data_byte      8       bslbf
                }
        }
        if (section_number ==
        last_section_number) {
                for (j=0;j<N2;j++) {
                        stuffing_byte           8       bslbf
                }
        }
                if (error_detection_type == 1) {
                        checksum                32      uimsbf
                }
                else {
                        CRC_32                  32      rpchof
        }
}
```

9.2.3.1 Semantic definitions of fields in DSMCC_addressable_section

For field semantics not defined below, refer to subclause 9.2.2.1

table_id -- this is an 8-bit field which shall be set to 0x3F.

error_detection_type -- This is a 1 bit flag. When set to '1', it indicates the presence of the checksum field. When set to '0', it indicates the presence of the CRC_32 field.

deviceId -- This 48-bit field contains the deviceId of the intended device. The deviceId is fragmented into 6 fields of 8-bits. The deviceId fields contain either a clear or a scrambled deviceId as indicated by the address_scrambling_control field.

payload_scrambling_control -- This 2-bit field defines the scrambling mode of the payload of the section. This includes the payload that starts after the deviceId[47..40] byte and excludes the checksum field. The value of this field is defined in the following table. The scrambling method applied is user private.

Table 9-5 Coding of the payload_scrambling_control field

Value	payload scrambling control
00	unscrambled
01	user defined
10	user defined
11	user defined

address_scrambling_control -- This 2-bit field defines the scrambling mode of deviceId in this section. The scrambling method applied is user private.

Table 9-6 Coding of the address_scrambling_control field

Value	address scrambling control
00	unscrambled
01	user defined
10	user defined
11	user defined

LLCSNAP_flag -- This is a 1-bit flag. If this flag is set to '1', the payload carries an LLC/SNAP encapsulated datagram following the deviceId[47..40] field. The LLCSNAP structure shall indicate the type of the datagram conveyed. If this flag is set to '0', the section shall contain an IP datagram without LLC/SNAP encapsulation. See subclause 9.2.5 for use of LLC/SNAP.

datagram_data_byte -- This 8 bit field shall contain a byte of the datagram payload.

stuffing_byte -- This is an optional 8-bit field whose value is not specified. Note: If the payload of the section is scrambled, these bytes shall be scrambled. The number of stuffing_bytes used should meet the data alignment requirements defined by the user.

CRC_32 -- This field shall be set as defined in ISO/IEC 13818-1:2000 Annex B. This field is only present when error_detection_type is set to '0'.

checksum -- A 32 bit checksum calculated over the entire DSMCC_addressable_section. The checksum shall be calculated by treating the DSMCC_addressable_section as a sequence of 32-bit integers and performing one's complement addition (an Exclusive-Or or XOR operation) over all the integers, most significant byte first, then taking the one's complement of the result. For the purpose of computing the checksum, the value of the checksum field shall be considered 0. If the message length is not a multiple of four bytes, the message shall be considered to be appended with zeroed bytes for the purpose of checksum calculation only. If the computed result is 0, then the result shall be set to 0xFFFFFFFF (the alternative value for a one's complement representation of 0). In cases where a checksum is not desired, the value of this field shall be set to 0 to indicate the checksum has not been calculated. This feature is useful for networks where error detection is provided at a protocol layer lower than the MPEG-2 Transport Stream. This field is only present when error_detection_type is set to '1'.

"

10) Replace existing Table 9-4 with the following:

"

Table 9-7 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) or DSM-CC Addressable Sections
0x0E - 0x7F	ITU-T Rec. H.222.0 | ISO/IEC 13818-1 reserved
0x80 - 0xFF	User private

"

11) Increment numbers of tables by 3 starting with existing Table 9-5 and subclauses by 1 starting with existing subclause 9.2.3:

