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

**Part 4:
Conformance testing**

**AMENDMENT 1
MPEG-2 IPMP conformance testing**

ISO/IEC 13818-4:2004/Amd.1:2005
Technologies de l'information — Codage générique des images
animées et des informations sonores associées —
Partie 4: Essais de conformité

AMENDEMENT 1: Essais de conformité MPEG-2 IPMP

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The main task of the joint technical committee is to prepare International Standards. 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 ISO/IEC 13818-4:2004 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia Information*.

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

Part 4: Conformance testing

AMENDMENT 1: MPEG-2 IPMP conformance testing

Add the following clauses at the end of Audio section:

2.6 Conformance for MPEG-2 IPMP

2.6.1 Introduction

In this document, the additional text to ISO/IEC 13818-4:2004 is specified for the conformance test of ISO/IEC 13818-1:2000/Amd.2 & 13818-11 MPEG-2 IPMP. In this clause, except where stated otherwise, the following terms are used for practical purposes:

The term 'content stream' or 'system stream' means ISO/IEC 13818-1:2000 system bitstream possibly with multiplexed ISO/IEC 13818-2:2000 visual streams and ISO/IEC 13818-3:1998 audio streams.

The term 'IPMP bitstream' means an MPEG-2 system stream with information of IPMP protection, including IPMP Descriptor, IPMP Stream, IPMP Tool List.

The term 'IPMP Information' means "IPMP Control Information" in PSI, "IPMP Descriptor" in PMT, and IPMP Stream that come from IPMP bitstream.

The term 'IPMP Data' means these IPMP data extended from IPMP_Data_BaseClass or other specific IPMP data to assist IPMP protection, these IPMP Data can be carried in either IPMP Descriptor, IPMP Stream, or IPMP Messages.

The term "IPMP Message" means the IPMP messages passed between terminal and IPMP tools via a non-normative messaging interface.

The term 'IPMP terminal' means a MPEG-2 terminal with IPMP Extension capability as specified in 13818-1:2000/Amd.2 & 13818-11 MPEG-2 IPMP.

If any statement stated in this sub-clause accidentally contradicts a statement or requirement defined in 13818-1:2000/Amd.2 & 13818-11 MPEG-2 IPMP, the text of 13818-1:2000/Amd.2 & 13818-11 MPEG-2 IPMP prevails.

The following subclauses specify the normative tests for verifying compliance of IPMP bitstream, IPMP Data and IPMP Message. Those normative tests make use of test suites and the reference software decoders specified in ISO/IEC 13818-5:2002/Amd.4 with source code available in electronic format.

2.6.2 Specification of test IPMP bitstreams

2.6.2.1 Conformance Requirements

IPMP information contained in PSI of MPEG-2 system stream shall comply with the specifications in 5 and 6 of ISO/IEC 13818-1:2000/Amd.2 & ISO/IEC 13818-11 (MPEG-2 IPMP).

2.6.2.2 Tolerance

There is no tolerance for IPMP Bitstream syntax checking. The diagnosis is pass or fail.

2.6.2.3 Terminal conformance

Each compliant IPMP terminal shall be able to parse and process all compliant IPMP bitstreams. As the implementation of IPMP terminals differs from each other depending on the implementers, the bit-wise comparison of the terminal output with a reference output may not work. The judgment should be done from the total behavior of the terminal.

2.6.2.4 Tool conformance

Not applicable.

2.6.2.5 Test IPMP Bitstream

2.6.2.5.1 #IPMPBS1

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BitStream: MPEG-2 TS stream with PAT, PMT, one MPEG-2 visual stream, and one MPEG-1 Layer 2 audio stream and IPMP information.

Specification: The IPMP information includes:
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- Tool List in PSI: containing one IPMP Tool ID.
- IPMP Descriptor in PMT. Specifying one IPMP Tool therein is to be loaded before MPEG-2 video decoder (control point is set before decode buffer).

Purpose:

- Verify that the IPMP terminal handles IPMP Tool List, makes sure the required tool is present.
- Verify that the IPMP terminal handles IPMP Descriptor, and launches the IPMP Tool according to information given in the IPMP Descriptor.

2.6.2.5.2 #IPMPBS2

BitStream: MPEG-2 TS stream with PAT, PMT, one MPEG-2 visual stream, and one MPEG-1 Layer 2 audio stream and IPMP information.

Specification: The IPMP information includes:

- Tool List: containing two IPMP Tool IDs.
- Two IPMP Descriptors in PMT: the IPMP Tools specified therein are to be loaded before MPEG-2 video render and before MPEG-1 Layer 2 audio decoder, respectively. (The control point is set accordingly).

Purpose:

- Verify that the IPMP terminal handles IPMP Tool List, makes sure the required tools are present.
- Verify that the IPMP terminal handles IPMP Descriptors, and launches the specified IPMP Tools according to information given in the IPMP Descriptors.

2.6.2.5.3 #IPMPBS3

BitStream: MPEG-2 TS stream with PAT, PMT, one MPEG-2 visual stream, and one MPEG-1 Layer 2 audio stream and IPMP information.

Specification: The IPMP information includes:

- Tool List: containing one IPMP Tool ID.
- Tool Container: carrying a tool that is specified by the Tool List.
- IPMP Descriptor in PMT: the IPMP Tool specified therein is to be loaded before MPEG-2 video decoder (the control point is set before decode buffer).

Purpose:

- Verify that the IPMP terminal handles IPMP Tool Container, makes sure the carried tool can be assembled and launched correctly.
- Verify that the IPMP terminal handles IPMP Descriptor, and launches the specified IPMP Tools according to information given in the IPMP Descriptor.

2.6.2.5.4 #IPMPBS4

BitStream: MPEG-2 TS stream with PAT, PMT, one MPEG-2 visual stream, and one MPEG-1 Layer 2 audio stream and IPMP information.

Specification: The IPMP information includes:

- Tool List: containing one IPMP Tool IDs.
- Rights Container: containing the rights information about the content.
- IPMP Descriptor: the IPMP Tool specified therein is a rights management tool, to be loaded at a global scope (control point=0).

Purpose:

- Verify that the IPMP terminal handles IPMP Rights Container, make sure the rights is either processed by the terminal, or delivered to the Rights Management Tool to process.
- Verify that the IPMP terminal handles IPMP Descriptor, and launches the specified IPMP Tools according to information given in the IPMP Descriptor.

2.6.2.5.5 #IPMPBS5

BitStream: MPEG-2 TS stream with PAT, PMT, one MPEG-2 visual stream, and one MPEG-1 Layer 2 audio stream and IPMP information.

Specification: The IPMP information includes:

- Tool List: containing two IPMP Tool IDs.
- Two IPMP Descriptors in PMT: the IPMP Tools specified therein are to be loaded before MPEG-2 video render and before MPEG-1 Layer 2 audio decoder, respectively. (The control point is set accordingly).
- IPMP Stream: It carries IPMP_StreamDataUpdate to be delivered to the above mentioned two IPMP Tools.

Purpose:

- Verify that the IPMP terminal handles IPMP Tool List, makes sure the required tools are present.
- Verify that the IPMP terminal handles IPMP Descriptors, and launches the specified IPMP Tools according to information given in the IPMP Descriptors.
- Verify that the IPMP terminal is able to parse the IPMP Stream, and deliver the IPMP_StreamDataUpdate to its designated IPMP Tool at the specified time.

2.6.2.5.6 Summary

The above bitstreams cover IPMP features that extend from MPEG-2 TS system (other IPMP features, e.g., messages, are discussed in next section). Table AMD1-1 summarize the above streams.

Table AMD1-1 — Summary of IPMP bitstreams

Name	Elem Streams	IPMP Descriptors	Tool List	Tool Container	Rights Container
IPMPBS1.ts	Video: 1 Audio: 1	Video: 1 Audio: n/a	One Tool ID is specified	n.a.	n.a.
IPMPBS2.ts	Video: 1 Audio: 1	Video: 1 Audio: 1	Two Tool IDs are specified	n.a.	n.a.
IPMPBS3.ts	Video: 1 Audio: 1	Video: 1 Audio: n.a.	One Tool ID is specified	One Tool is carried	n.a.
IPMPBS4.ts	Video: 1 Audio: 1	Video: n.a. Audio: n.a.	One Tool ID is specified	n.a.	Rights data is carried
IPMPBS5.ts	Video: 1 Audio: 1 IPMP Stream: 1	Video: 1 Audio: 1	Two Tool IDs are specified	n.a.	n.a.

2.6.3 Specification of test IPMP data

2.6.3.1 Conformance Requirements

IPMP Data shall comply with the specifications in ISO/IEC 13818-1:2000/Amd.2 & ISO/IEC 13818-11 (MPEG-2 IPMP).

2.6.3.2 Tolerance

There is no tolerance for IPMP Data syntax checking. The diagnosis is pass or fail.

2.6.3.3 Terminal conformance

Some IPMP data is meant to be carried in messages passed between terminal and IPMP Tool, some IPMP data is meant to be carried in IPMP bitstream, while some of them can be carried in both messages between terminal and IPMP Tool, as well as IPMP bitstream.

Hence a compliant IPMP terminal is not required to be able to parse all IPMP data. The IPMP Data that a compliant IPMP terminal should be able to parse and process is marked as “TM”.

Some IPMP data does not require an output, the judgment should be done from the total behavior of the terminal.

2.6.3.4 Tool conformance

Some IPMP data does not require an output; the judgment should be done from the overall behavior of the IPMP Tool.

2.6.3.5 Test IPMP Data

IPMP Data	Terminal/Tool Conformance	Specification and purpose
Mutual Authentication Related IPMP Data		
AlgorithmDescriptor	TM/TO	This class is for specifying an identifier of an authentication related algorithm
AuthCodes	TM/TO	Authentication codes for IPMP_MutualAuthentication messages
BaseAuthenticationDescriptor	TM/TO	The base for authentication descriptors
Certificate	TM/TO	A generic certificate
DateClass	TM/TO	Contains the audit date of IPMP tool in question, in Universal Time, Co-ordinated (UTC) and Modified Julian Date (MJD)
KeyDescriptor	TM/TO	This class is for specifying a cryptographic algorithm and a key conforming to the algorithm
IPMP_InitAuthentication	TM/TO	Message that initiates a mutual authentication process
IPMP_MutualAuthentication	TM/TO	Messages exchanged during mutual authentication process
TrustSecurityMetadata	TM/TO	Message carrying metadata for the verification of trust between two tools
IPMP Tool Connection and Disconnection		
IPMP_GetTools	TM/TO	This message is sent by a Tool to the Terminal to find all the tools, instantiated or not, that are available on the terminal
IPMP_GetToolsResponse	TM/TO	This message is sent by the Terminal to a Tool in reply of an IPMP_GetTools request