

EBU

OPERATING EUROVISION AND EURORADIO

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UNIDIRECTIONAL TRANSPORT OF CONSTANT BIT RATE MPEG-2 TS ON IP NETWORKS

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Conformance Notation

This document contains both normative text and informative text.

All text is normative except for that in the Introduction, any section explicitly labelled as 'Informative' or individual paragraphs which start with 'Note:'.

Normative text describes indispensable or mandatory elements. It contains the conformance keywords 'shall', 'should' or 'may', defined as follows:

- 'Shall' and 'shall not': Indicate requirements to be followed strictly and from which no deviation is permitted in order to conform to the document.
- 'Should' and 'should not': Indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others.
OR indicate that a certain course of action is preferred but not necessarily required.
OR indicate that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.
- 'May' and 'need not': Indicate a course of action permissible within the limits of the document.

Default identifies mandatory (in phrases containing "shall") or recommended (in phrases containing "should") presets that can, optionally, be overwritten by user action or supplemented with other options in advanced applications. Mandatory defaults must be supported. The support of recommended defaults is preferred, but not necessarily required.

Informative text is potentially helpful to the user, but it is not indispensable and it does not affect the normative text. Informative text does not contain any conformance keywords.

A conformant implementation is one which includes all mandatory provisions ('shall') and, if implemented, all recommended provisions ('should') as described. A conformant implementation need not implement optional provisions ('may') and need not implement them as described.

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Unidirectional transport of constant bit rate MPEG-2 Transport Streams on IP Networks

<i>EBU Committee</i>	<i>First Issued</i>	<i>Revised</i>	<i>Re-issued</i>
NMC	2010	2015 ¹	

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1. Scope

This document sets out a set of parameters necessary to ensure interoperability between equipment intended for the unidirectional transport of contribution-quality constant bit rate MPEG-2 Transport Streams over IP networks. The specification of compression formats themselves is out of the scope of this paper.

2. Introduction

Today MPEG-2 and MPEG-4 coders/decoders are still by far most used to compress/decompress video for transport over WAN links. Both MPEG-2 and MPEG-4/H.264 use the MPEG transport stream (MPEG-TS) as defined in ISO/IEC standard 13818-1 for lossy media (i.e. not errorless). It is expected that in the future other compression formats (beside MPEG-2 and MPEG-4) will be transported in the MPEG-TS.

The following data rates are typically required for good quality video contribution:

- ~4 - 30 Mbit/s for SD (576i/25)
- ~30 - 300 Mbit/s for HD (1080i/25, 720p/50)
- ~30 - 500 Mbit/s for HD (1080p/50)

The SMPTE already specifies the Unidirectional Transport of Constant Bit Rate MPEG-2 Transport Streams on IP and the relevant Forward error correction schema in their standards SMPTE 022-2-2007 (Transport) and SMPTE 2022-1-2007 (Forward error correction). These standards give a wide range of implementation possibilities. This recommendation specifies a sub-set of parameters from these two standards in order to provide an easy to implement/choose configuration set representing the most important user requirements. Still, the complete settings of SMPTE 2022-2-2007 and SMPTE 2022-1-2007 may be supported in the equipment used for the unidirectional transport of contribution-quality constant bit rate MPEG-2 Transport Streams over IP networks.

The EBU has been investigating example applications and has collected user requirements. The analysis of these requirements has led to this recommendation, which users and implementers are encouraged to follow in their contribution/transport networks and in implementing their products.

¹ Editorial revision, with a new cover, and a typo and a bibliographic reference corrected.

3. Recommendations

The EBU recommends the following implementation parameters in order to support unidirectional transport of contribution-quality constant bit rate MPEG-2 Transport Streams over IP networks.

The transport of MPEG-TS over IP networks **SHALL** be compliant to SMPTE 2022-2-2007 (Unidirectional transport of constant bit rate MPEG-2 Transport Streams on IP Networks). The following adjustments/specifications to the standard **MUST** be implemented:

- Transport of 7 TS packets per IP packet **MUST** be supported. The sender and receiver **MAY** allow to set the number of TS packets in one IP packet to any natural number between 1 and 7.
- Only class 1 (i.e. 188 byte TS packets) **MUST** be supported. The support of 204 byte TS packets is **OPTIONAL**.

Users **MUST** be able to use or not use FEC. When FEC is used, SMPTE 2022-1-2007 (Forward Error Correction for Real-Time Video/Audio Transport Over IP Networks) Level B (row and column) **MUST** be supported. Level A **MAY** be used.

4. Bibliography

SMPTE 2022-2-2007	Unidirectional transport of constant bit rate MPEG-2 Transport Streams on IP Networks
SMPTE 2022-1-2007	Forward Error Correction for Real-Time Video/Audio Transport Over IP Networks
ISO/IEC 13818-1:2000	Information technology -- Generic coding of moving pictures and associated audio information: Systems)