

SMPTE STANDARD

Seamless Protection Switching of
SMPTE ST 2022 IP Datagrams



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Foreword

SMPTE (the Society of Motion Picture and Television Engineers) is an internationally-recognized standards developing organization. Headquartered and incorporated in the United States of America, SMPTE has members in over 80 countries on six continents. SMPTE's Engineering Documents, including Standards, Recommended Practices, and Engineering Guidelines, are prepared by SMPTE's Technology Committees. Participation in these Committees is open to all with a bona fide interest in their work. SMPTE cooperates closely with other standards-developing organizations, including ISO, IEC and ITU.

SMPTE Engineering Documents are drafted in accordance with the rules given in Part XIII of its Operations Manual.

SMPTE ST 2022-7 was prepared by Technology Committee 32NF on Network/Facilities Architecture.

Intellectual Property

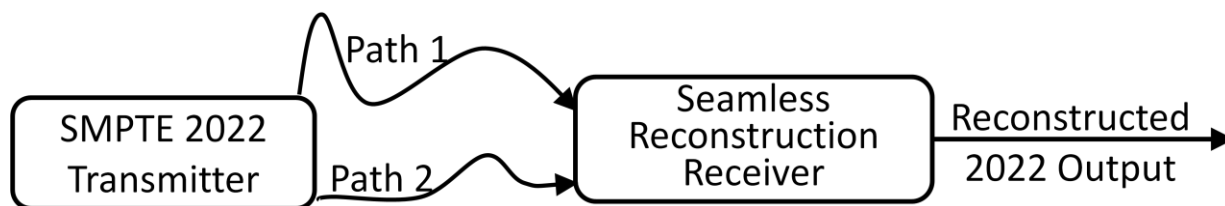
At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Engineering Document. However, attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. SMPTE shall not be held responsible for identifying any or all such patent rights.

Introduction

This section is entirely informative and does not form an integral part of this Engineering Document.

This document is a standard for seamless reconstruction of a stream of SMPTE ST 2022 RTP datagrams based on the transmission of two streams of identical content over potentially diverse paths. The primary reason for this standard is to facilitate interoperability between SMPTE ST 2022 equipment used to transport signals intended for such reconstruction.

Cost effective error free transport of video is a constant goal. As costs of redundant network paths decrease sending redundant streams becomes a more viable option. This standard defines requirements on redundant streams such that a receiver could switch between them datagram by datagram without impact to the content or the stream.



1 Scope

This standard defines requirements for redundant streams of SMPTE 2022 packets to allow for creation of a single reconstructed output stream through seamless protection switching at the RTP datagram level.

2 Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except: the Introduction, any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:"

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document.

The keyword "reserved" indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword "forbidden" indicates "reserved" and in addition indicates that the provision will never be defined in the future.

A conformant implementation according to this document is one that 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.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows: Normative prose shall be the authoritative definition; Tables shall be next; followed by formal languages; then figures; and then any other language forms.

3 Normative References

Note: All references in this document to other SMPTE documents use the current numbering style (e.g. SMPTE ST 2022-1:2007) although, during a transitional phase, the document as published (printed or PDF) may bear an older designation (such as SMPTE 2022-1:2007). Documents with the same root number (e.g. 274) and publication year (e.g. 2008) are functionally identical.

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

IETF RFC 3550 – RTP: A Transport Protocol for Real Time Applications

SMPTE ST 2022-1:2007, Forward Error Correction for Real-Time Video/Audio Transport Over IP Networks

SMPTE ST 2022-2:2007, Unidirectional Transport of Constant Bit Rate MPEG-2 Transport Streams on IP Networks

SMPTE ST 2022-3:2010, Unidirectional Transport of Variable Bit Rate MPEG-2 Transport Streams on IP Networks

SMPTE ST 2022-4:2011, Unidirectional Transport of Non-Piecewise Constant Variable Bit Rate MPEG-2 Streams on IP Networks

SMPTE ST 2022-5:2013, Forward Error Correction for High Bit Rate Media Transport over IP Networks (HBRMT)

SMPTE ST 2022-6:2012, Transport of High Bit Rate Media Signals over IP Networks (HBRMT)

4 Acronyms

ASI – Asynchronous Serial Interface

DWDM – Dense Wave Division Multiplexing

FEC – Forward Error Correction

HBR – High Bit Rate

MAC – Media Access Control

MPLS – Multiprotocol Label Switching

QOS – Quality of Service

RTP – Real Time Protocol (see IETF RFC 3550)

SBR – Slower Bit Rate

VSID – Video Source ID

VPN – Virtual Private Network

5 Definitions

5.1

Class HBR

A Class HBR (High Bit Rate) stream is a flow of datagrams in accordance with SMPTE ST 2022-5 or SMPTE ST 2022-6 with a payload bit rate greater than or equal to 270 Mbps.

5.2

Class SBR

A Class SBR (Slower Bit Rate) stream is a flow of datagrams in accordance with SMPTE ST 2022-1, SMPTE ST 2022-2, SMPTE ST 2022-3, or SMPTE ST 2022-4 with a payload bit rate of less than 270 Mbps.

5.3

Datagram Copies

A set of redundant RTP datagrams, perhaps transmitted to a different IP destination or port, but having identical contents in the RTP header and RTP payload.