SMPTE ST 268-2:2018
Amendment 1:2022

SMPTE STANDARD

Digital Moving-Picture Exchange (DPX) – Format Extensions for High Dynamic Range and Wide Color Gamut – Amendment 1

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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 its Standards Operations Manual. This SMPTE Engineering Document was prepared by Technology Committee 31FS.

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; then formal languages; then figures; and then any other language forms.

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.

1 Scope

This amendment contains the registration template for the image/dpx MIME type.

2 Add New Annex D

The following text is added as Annex D:

Annex D IANA MIME Type Registration Template (informative)

This annex serves to register and document the MIME Type image/dpx, which is associated with files conforming to SMPTE ST 268-1 or SMPTE ST 268-2. The registration is intended to address the requirements of IETF RFC 6838.

D.1 Media type name

image

D.2 Media subtype name

dpx

D.3 Required parameters

N/A

D.4 Optional parameters

`standard` – If specified, the parameter indicates the version of the SMPTE standard with which the file complies. At the time of IANA registration, the possible values are `st268-1` (for SMPTE ST 268-1) and `st268-2` (for SMPTE ST 268-2).

If the `standard` parameter is absent, the file can comply with any version of the SMPTE standard.

D.5 Encoding considerations

binary

D.6 Security considerations

DPX files only encode images with corresponding metadata and do not employ executable content.

The header defines a "user-defined information" section that can contain arbitrary binary data. As such, a maliciously coded file could contain a binary blob comprising executable content. Therefore, the user-defined header must not contain executable content, and implementations that receive, display, or otherwise process images must preclude the execution of any executable content that might be received.

Some files also contain a “standards-based metadata” section that can include arbitrary XML. Such XML could include potentially harmful or malicious links to other resources.

Implementations will need to ensure that a received file can be handled within the available memory. DPX allows run-length encoding, so decoders will need suitable bounds checks to ensure that memory locations outside the allocated decoded image buffer cannot be altered.

DPX files do not have integral encryption or authentication. A 32-bit “encryption key” field is defined in SMPTE ST 268-1, but the standard does not specify an encryption algorithm; therefore, utilizing the field for encrypting picture data will generally not be interoperable. Any file protection, privacy, or integrity requirements must be handled using an external mechanism.

D.7 Interoperability considerations

SMPTE ST 268-1 has been very widely used since it was standardized (initially as SMPTE 268M:1994) but has experienced some interoperability issues in practice. These issues have occurred primarily due to conflicting interpretations relating specifically to how the pixel data is ordered, packed, and padded. SMPTE ST 268-2 has improved interoperability due to the inclusion of metadata that resolves ambiguities that are present in ST 268-1. However, ST 268-2 is a more recent standard, whereas ST 268-1 has been widely used for many years prior and is employed in voluminous archives.

Both ST 268-1 and ST 268-2 define core fields and values. Files must include all core fields, and reader or receiver implementations must interpret all core fields and values.

D.8 Published specification

SMPTE ST 268-1; SMPTE ST 268-2 (which incorporates ST 268-1 by reference)

D.9 Applications which use this media

DPX is derived from Kodak's Cineon format and is used primarily as a file format for digitization of camera-captured frames and as a digital intermediate file format.

D.10 Fragment identifier considerations

N/A

D.11 Restrictions on usage

N/A

D.12 Additional information

D.12.1 Deprecated alias names for this type

N/A

D.12.2 Magic number(s)

hex 53 44 50 58 (most-significant byte first file) or 58 50 44 53 (least-significant byte first file)

D.12.3 File extension(s)

dpx

D.12.4 Macintosh file type code

N/A

D.12.5 Object Identifiers

N/A

D.13 Person to contact for further information

Name: Director of Standards Development

Email: standards-support@smpte.org

D.14 Intended usage

Common

D.15 Author/Change controller

Society of Motion Picture and Television Engineers ("SMPTE")

3 Add new Bibliography item

The following text is added to the Bibliography:

IETF RFC 6838 – Media Type Specifications and Registration Procedures.