SLOVENSKI STANDARD
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Krovne določbe za digitalno varstvo kinematografskih del - Paket za varstvo filmov

A framework for digital preservation of cinematographic works - The Cinema Preservation Package

Ein Rahmenwerk für die digitale Erhaltung von kinematografischen Werken - Das Cinema Preservation Package

Un cadre pour la conservation numérique des oeuvres cinématographiques - Le paquetage de conservation cinéma

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 457.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 17650:2021) has been prepared by Technical Committee CEN/TC 457 “Digital preservation of cinematographic works”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

The European Project targets the publication of a Technical Report complementing this document.

Introduction

This document is part of a series of standards and technical recommendations for the digital preservation of cinematographic work. It gives European film archives and producers a guideline how to store and manage film content in the digital age. The document references many existing formats and elements and serves as a super-format which includes other existing sub-formats like DCPs or IMPs for movies, XML-files for packaging-lists or subtitles, AV files and metadata files. In addition, methods will be integrated to ensure data integrity and quality by calculating hash and fingerprinting-values.

This document reuses describing tools and archiving formats from the cinema archiving community as much as possible.

1 Scope

This document defines the Cinema Preservation Package (CPP) to facilitate the digital preservation of cinematographic works. It defines methods to describe the relationship of components of the cinematographic work and delivers a syntax to describe the package content. The document itself defines the structure of the package and specifies the constraints that are necessary to enable compliance and interoperability.

Versions of the content using different encoding formats can be preserved in a layered structure where the lowest level is describing the physical file. The files can carry data representing moving images, sound, metadata or ancillary information like quality control (QC) protocols or film posters.

The Cinema Preservation Package also contains hash values on different levels to ensure data integrity and version control. The syntax for this description and the methods for the hash value generation are defined in this document. Various types of content coding are described as reference for concrete implementations.

The Cinema Preservation Package is well suited to serve as a Submission Information Package (SIP) in an OAIS compliant preservation system or as a self-contained exchange format between media archives. The CPP does not necessarily contain a complete cinematographic work, it can also be used for exchange of parts of a work.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15744, *Film identification - Minimum set of metadata for cinematographic works*

ISO 639-1, *Codes for the representation of names of languages — Part 1: Alpha-2 code*

ISO 639-2, *Codes for the representation of names of languages — Part 2: Alpha-3 code*

ISO 639-3:2007, *Codes for the representation of names of languages — Part 3: Alpha-3 code for comprehensive coverage of languages*

ISO 8601-1, *Date and time — Representations for information interchange — Part 1: Basic rules*

ISO 26429-3:2008, *Digital cinema (D-cinema) packaging — Part 3: Sound and picture track file*

ISO 26429-4:2008, *Digital cinema (D-cinema) packaging — Part 4: MXF JPEG 2000 application*

ISO 26429-6:2008, *Digital cinema (D-cinema) packaging — Part 6: MXF track file essence encryption*

ISO 26429-7:2008, *Digital cinema (D-cinema) packaging — Part 7: Composition playlist*

ISO 26429-8:2009, *Digital cinema (D-cinema) packaging — Part 8: Packing list*

ISO 26429-9:2009, *Digital cinema (D-cinema) packaging — Part 9: Asset mapping and file segmentation*

ISO 26429-10:2009, *Digital cinema (D-cinema) packaging — Part 10: Stereoscopic picture track file*

ISO/IEC 9834-8, *Information technology — Procedures for the operation of object identifier registration authorities — Part 8: Generation of universally unique identifiers (UUIDs) and their use in object identifiers*

ISO/IEC 23091-3:2018, *Information technology — Coding-independent code points — Part 3: Audio*

SMPTE ST 12-1:2008, *SMPTE Standard - For Television — Time and Control Code*

SMPTE ST 429 series, *SMPTE Standard - D-Cinema Packaging*

SMPTE ST 2065-4:2013, *SMPTE Standard - ACES Image Container File Layout*

SMPTE ST 2067-3:2020, *SMPTE Standard - Interoperable Master Format — Composition Playlist*

W3C - Extensible Markup Language (XML) 1.1 (Second Edition)

ITU-T H.273:2016, *Coding-independent code points for video signal type identification*

METS Metadata Encoding & Transmission Standard. Version 1.12.1. [online]. Library of Congress, 2019. Available from: https://www.loc.gov/standards/mets/

PREMIS Data Dictionary for Preservation Metadata. Version 3.0. [online]. Library of Congress, 2015. Available from https://www.loc.gov/standards/premis/

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
audio channel
signal corresponding to a space localisation

3.2
audio track
part of a sound file describing a pseudo-continuous modulation

3.3
cinema preservation package
package containing, if possible, all digital data for a cinematographic work

3.4
container
file containing multiple data objects wrapped in a specific way

3.5
package
set of files or folders belonging together

3.6
soundfield
time and space related sound phenomenon

Note 1 to entry: A soundfield can be described as a discrete set of signals, monophonic or multichannel, or other representation.

3.7
sound sequence
portion of time in a work

3.8
subcomponent
media file element to be included

3.9
subpackage
data collection of the Cinema Preservation Package containing part of a cinematographic work as subcomponent with data and supplemental data separately stored in a folder

3.10
submission information package
package sent from the producer to the archive

Note 1 to entry: The SIP is defined in the OAIS Model.

4 Abbreviations

CPP	Cinema Preservation Package
DCP	Digital Cinema Package
IMF	Interoperable Master Format
MP4	MPEG-4 ISO/IEC 14496-12 container format to store video and audio data
OAIS	Open Archive Information System according ISO 14721:2012
PID	persistent identifier
PNG	Portable Network Graphics
SIP	Submission Information Package
TIF or TIFF	Tagged Image File Format
UUID	Universally Unique Identifier
XML	Extensible Markup Language

5 Writing convention used in this document

5.1 General

For the file and folder name description the following conventions are used in the description figures.

5.2 Expressions used to denote file or folder names

5.2.1 Composition of name with parts

A name may be composed of one or several parts.

5.2.2 Literal parts

A literal part appearing between quotes shall appear as is.

EXAMPLE "LiteralPart" designates a part which is exactly "LiteralPart".

5.2.3 Optional part

A part appearing between brackets shall appear zero or one time.

EXAMPLE ["OptionalPart"]"Radical" designates a name which is either "OptionalPartRadical" or "Radical".

5.2.4 Alternative parts

Exactly one of the items appearing between parentheisis shall appear in the result.

EXAMPLE ("Prefix1" | "Prefix2" | "Prefix3")"Radical" designates a name which is either "Prefix1Radical", "Prefix2Radical" or "Prefix3Radical".

5.2.5 Explicitly defined part

If a name part appears between ' < ' and ' > ', the whole part shall be substituted with the construction as specified by the prose.

EXAMPLE "Name_" < *custom identifier* > designates name which could be "Name_0123456789", supposing "0123456789" is defined as a valid custom identifier.

5.3 Expressions used to denote file or folder multiplicity

5.3.1 General

Some files or folders may appear several times in the parent folder. The final modifier therefore indicates the allowed multiplicity.

5.3.2 One occurrence or more

A file or folder name with a trailing '+' shall appear one or more time in the parent folder.

EXAMPLE "File_"<*number*>+ designates a set of multiple files such as "File_0000", or "File_0000" and "File_0001" and "File_0002", etc., assuming the prose describe such a 4 digit numbering.

5.3.3 Zero occurrence or more

A file or folder name with a trailing '*' shall appear zero or more time in the parent folder.

EXAMPLE "File_"<*number*>* designates a set of multiple files such as no file, "File_0000", or "File_0000" and "File_0001" and "File_0002", etc., assuming the prose describe such a 4 digit numbering.

5.3.4 Optional file or folder

A file or folder name with a trailing '?' shall appear zero or one time in the parent folder.

EXAMPLE "OptionalFile"? designates no file, or exactly one file with name "OptionalFile".

5.4 Conventions used to denote XML content

5.4.1 General consideration

Constraints on XML files are specified either as an XML Schema to apply, either as listed constraints for each element of a list of specific XML Node.

5.4.2 Hierarchy

To denote a node the XPath syntax is used.

EXAMPLE "/rootElement/subElement/subSubElement" denotes an element with name "<subSubElement>" which is children of a "<subElement>" element, which is itself child of the "<rootElement>" root element.

5.4.3 Namespace

XML elements may use a prefix to denote a namespace. The prefix indicated in the prose is only used for convenience do denote a namespace. The prefix in the file may be different and this is suitable as long as the relation with the namespace is correctly indicated as a namespace attribute from a parent element.

EXAMPLE "/mainNs:rootElement/mainNs:subElement" the "<rootElement>" and the "subElement" belongs to the namespace denoted by "mainNs" in the prose.

5.4.4 Sub-elements

The following are used:

— @attributeName: denotes the name of an attribute of the element

— #children: denotes the child elements

— #text: denotes the child text of the element

EXAMPLE < mainNs:rootElement @attribute1 = "example 1" >

<subelement1/>

<subelement2>example 2</subelement2>

</mainNs:rootElement>

"/mainNs:rootElement/#children" denotes "subelement1, subelement2"

"/mainNs:rootElement/@attribute1" denotes attribute1 with value "example 1"

"/mainNs:rootElement/subelement2/#text" denotes "example 2"

5.4.5 Property

If the XPath includes a part inside brackets, this is a constraint to properly address the right element.

EXAMPLE "/mainNs:rootElement/subelement[@position='first']" denotes the <subelement> element which is child of the root element "<rootElement>" and has an attribute "position" with value "first".

6 Core structure

6.1 General description

The Cinema Preservation Package shall be a set of files hierarchically organized as described in this document.

The items stored shall belong to a subcomponent type list and are part of the folder tree. The stored items shall be related to the same work and variant.

Metadata files shall be added at the root of the file tree and in designated subdirectories.

6.2 Root Folder structure

6.2.1 Synthetic view (informative)

The root folder encloses the following files and subfolders:

— < *Preservation Package Instance name* >

- “preservationPackingList.xml”
- “playlists”?
- (“sound”|
  ”image”|
  ”timedText”|
  ”audiovisual”|
  ”componentized”)”Package_”*<uuid>+*
- “extraPackage_”*<uuid>**
- “metadata”
- “ancillaryData”?
- “checkerReports”?

6.2.2 Root folder name

The root folder name designated as < *Preservation Package Instance name* > should follow the pattern: *<titleName>[“_”<variantName>][“_” < work identifying system name > < work identifier >]*

Where:

— *<titleName>* should be the original title, with alphanumerical ASCII characters, with ‘-‘ as word separator;

— *<variantName>* if present should be the designation of the variant, with alphanumerical ASCII characters, with ‘-‘ as word separator;

— < *work identifying system name* > should be a prefix of four alphabetical upper-case characters.

— < *work identifier* > should be the identification of the work in the system denoted by the preceding prefix, using only alphanumerical ASCII characters and ‘-‘.

NOTE The preservation facility can use the identification of the work from their local catalogues.