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Date: YYYY-MM-DD

**Carriage of access unit metadata** (Introductory element — Main element — Part #: Part title)

WD stage

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](https://www.iso.org/directives-and-policies.html)).

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This document was prepared by Technical Committee *[or Project Committee]* ISO/TC *[or ISO/PC]* ###, *[name of committee]*, Subcommittee SC ##, *[name of subcommittee]*.

This second/third/… edition cancels and replaces the first/second/… edition (ISO #####:####), which has been technically revised.

The main changes are as follows:

— xxx xxxxxxx xxx xxxx

A list of all parts in the ISO ##### series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](https://www.iso.org/members.html).

Introduction

TBD

Carriage of access unit metadata (Introductory element — Main element — Part #: Part title)

# Scope *(mandatory)*

TBD

# Normative references *(mandatory)*

*Two options of text (remove the inappropriate option).*

*1) The normative references shall be introduced by the following wording.*

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.

ISO #####‑#, *General title — Part #: Title of part*

ISO #####‑##:20##, *General title — Part ##: Title of part*

*2) If no references exist, include the following phrase below the clause title:*

There are no normative references in this document.

# Terms and definitions *(mandatory)*

*Four options of text (remove the inappropriate options).*

*1) If all the specific terms and definitions are provided in Clause 3, use the following introductory text:*

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

*2) If reference is given to an external document, use the following introductory text:*

For the purposes of this document, the terms and definitions given in [external document reference xxx] apply.

*3) If terms and definitions are provided in Clause 3, in addition to a reference to an external document, use the following introductory text:*

For the purposes of this document, the terms and definitions given in [external document reference xxx] and the following apply.

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No terms and definitions are listed in this document.

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3.1

term

text of the definition

Note 1 to entry: Text of the note.

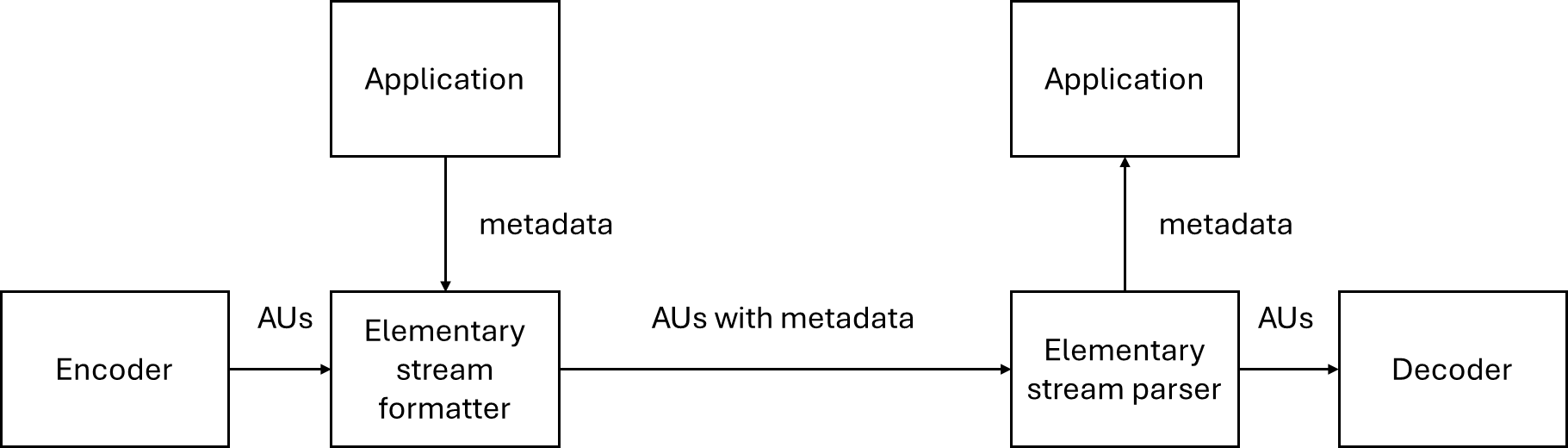
[SOURCE: …]

3.2

term

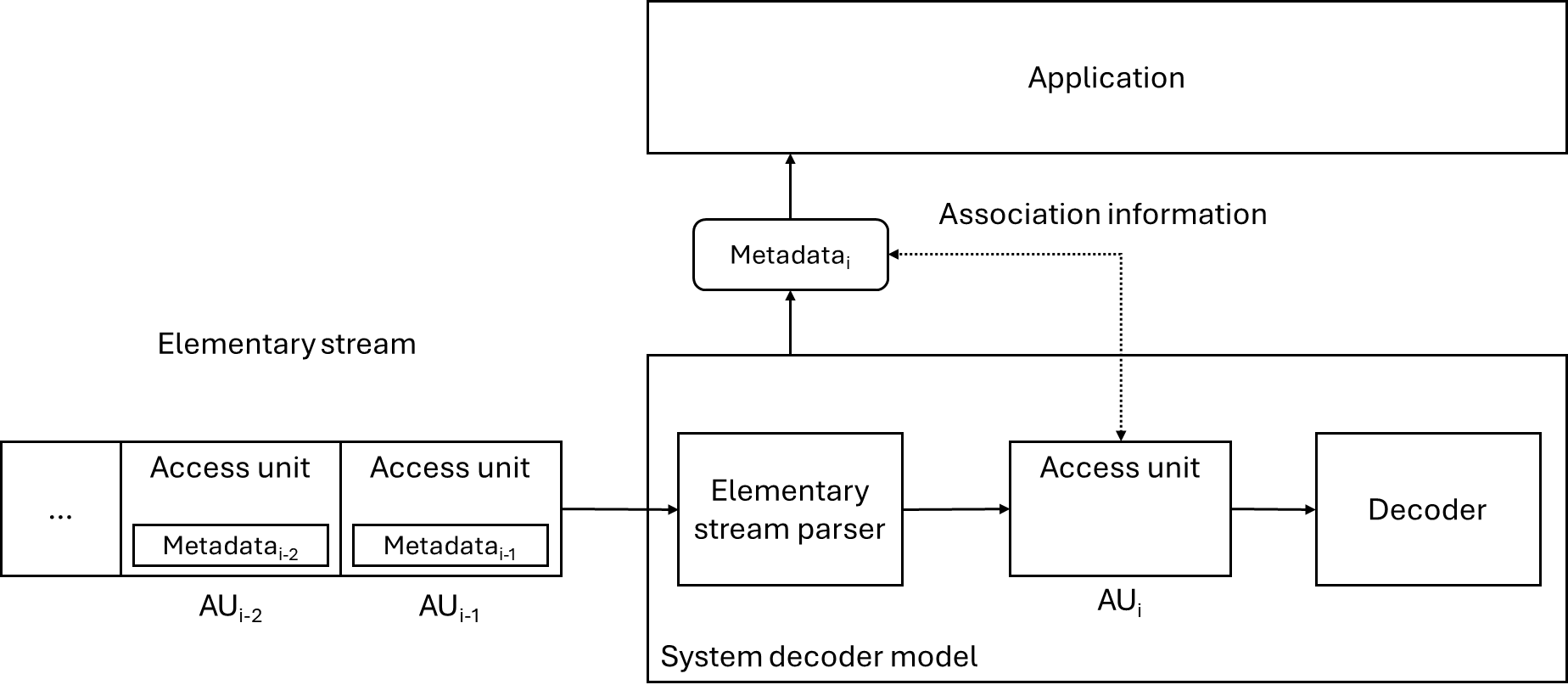
text of the definition

# System architecture



1. System architecture

# System client model



1. System client model

# Access unit metadata

## General

The access unit metadata is a binary structure that contains any type of metadata payload. The access unit metadata comprises first a metadata identifier followed by a payload. The structure of the payload is determined by the metadata identifier.

## Syntax and semantics

class AccessUnitMetadata  
{

unsigned int(8) metadata\_type;  
 MetadataPayload payload(metadata\_type);

}

[Editor’s note: Further study is needed on adding an identifier for a given access unit metadata in order to keep the information association between the metadata an the access unit. For example, there could be a POC value in the AccessUnitMetadata such that the association is kept even after decoding the coded video picture.]

class MetadataPayload (int metadata\_type)  
{

switch(metadata\_type) {

case 0: // MPEG-reserved (to be discussed if needed)

metadata\_integer(0);  
 case 1:

metadata\_integer(1);  
…

case 254:

metadata\_urn\_based(); // For external spec

case 255:

metadata\_uuid\_based(); // For external org

}

}

[Editor’s note: Further discussion is needed to determine the need of number-based, URN and uuid-based.]

# Definition of metadata payload

[Editor’s note: Further discussion is needed to determine the need of number-based, URN and uuid-based.]

## Integer-based payload definition

class metadata\_integer(int metadata\_integer\_type)  
{

TBD

}

## URN-based payload definition

class metadata\_urn\_based()  
{

TBD

}

## UUID-based payload definition

class metadata\_uuid\_based()  
{

TBD

}

# Carriage of the access unit metadata

## General

The access unit metadata may be carried in two ways. The first method is to carry the access unit metadata as an ITU T-35 message, as defined in Clause 8.2, which is in turn transported in the elementary stream . The second method is to carry the access unit metadata as part of the elementary stream as defined in Clause 8.3.

NOTE The use of ITU T-35 messages for carrying the access unit metadata depends on the support of ITU T-35 messages by the targeted elementary stream.

## Carriage as ITU T-35 messages

[Editor’s note: Further study is needed to understand the current support in different types of media bitstream, video, audio, etc...]

### General

The structure of a ITU T-35 message consists of three parts:

* country code
* terminal provider code
* terminal provider oriented code

For generating an ITU T-35 message containing an access unit metadata, the following requirements apply:

* The country code value shall be equal to 0xXX
* The terminal provider code value shall be equal to 0xYY
* The terminal provider oriented code value shall be equal to 0xZZ

[Editor’s note: Those values will need to be registered by MPEG. ]

### Envelop syntax and semantics

class ITUT35MetadataEnvelop()  
{

unsigned int(8) country\_code = 0xXX;

unsigned int(8) terminal\_provider\_code = 0xYY;

unsigned int(8) terminal\_provider\_oriented\_code = 0xZZ;

AccessUnitMetadata metadata;

}

## Carriage in elementary streams

### Video elementary streams

[Editor’s note: Further study needed based on the possible solutions in the exploration document. ]

### Audio elementary streams

[Editor’s note: Further study needed based on the possible solutions in the exploration document. ]

# Metadata processing APIs

## General

The metadata processing APIs are operating at the elementary stream level. For insertion of the metadata access unit, the API takes as input an elementary stream and outputs an elementary stream in which access units can contain access unit metadata. For extraction, the API takes as input an elementary stream with access unit metadata and generates an output elementary stream which does not contain any access unit metadata. The extracted access unit metadata are passed to the application for further processing.

## Metadata insertion API (informative)

[Editor’s note: This is considered informative for now, but further discussion needed.]

## Metadata extraction API

[Editor’s note: Further discussion is needed to identify the relevant APIs, e.g. MSE, WebCodecs, VDI, etc...]

1. (informative)  
     
   Example applications using access unit metadata
   1. Split rendering applications
      1. Description

Users expect realistic and high-fidelity immersive experiences in gaming, entertainment, and communication applications and services. At the same time, mobile, portable devices and HMDs have constrained capabilities for rendering those experiences.

Split rendering has been identified as a promising approach to address these challenges. With split rendering, the whole rendering process or parts thereof are performed in the network, for example in an edge that is supported by a reliable and optimized network such as 5G.

A basic architecture for Split Rendering is shown Figure A.1.



1. Basic Split rendering architecture

In this case, an application resides in a network server that runs a game engine to generate and render complex scenes. For a specific user, pose, controller and tracking information is used in order to render the scene. In addition, a specific viewport of the scene is rendered by the user and regular encoders for audio and video send regular media data to a device. The device decodes the information, and finally send this to a composition process, that does the final presentation using the latest pose and environment information to the users, for example by Asynchronous Time Warping (ATW), etc.

The client device expects each rendered frame to be accompanied by a description of the pose that was used to render that frame. Other information such as the FoV and the XR space may be static and do not need to be sent with every frame. The received pose information with each frame is used to perform any pose correction prior to display.

Bibliography

[1] ISO #####‑#, *General title — Part #: Title of part*

[2] ISO #####‑##:20##, *General title — Part ##: Title of part*