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Title **ISOBMFF and Image File Format possible corrections**
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1 Introduction

We have implemented some support for the Image File Format (IFF) in the GPAC Open Source Software (http://gpac.io) in particular the ability to package images in IFF files. While doing this we found some unclear points in the associated standards. This contribution suggests some possible corrections.

2 Discussion

2.1 essential vs mandatory

On the one hand, the standard defines that some item properties are mandatory, such as the 'hvcC' box for an HEVC image, the 'avcC' box for an AVC image, or the 'ispe' box for all images.

On the other hand, it defines that the essential flag indicates that the property is essential for the author and the item should not be processed if the property is not supported. It was meant for transformative properties such as rotation, crop …

It is unclear if all mandatory boxes should be marked essential. For instance, the 'ispe' box may not be considered 'essential' as its information is provided in the 'hvcC' box. Similarly, the 'hvcC' box will not be ignored even if marked non-essential.

We suggest adding the following statements:
"All properties specified as mandatory for an item type shall be marked essential."

2.2 HEVC Tile item

The current specification enables the storage of an HEVC tile as an item of type 'hvt1'. The specification indicates that the reconstructed image for this item is the tile. In particular it indicates that it shall have an 'rloc' property and an 'ispe' property, that the 'ispe' documents the size of the tile and that the 'rloc' documents the position of the tile within the complete image. Additionally, the presence of the 'rloc' property requires an item reference of type 'tbas' to the complete HEVC picture.

Given these definitions, in particular with the definition of the reconstructed image, it would be possible to display a single tile item, not the complete picture. However, it is not possible to store a single tile item without its associated complete picture, because the item reference of type 'tbas' cannot be created and because it is required by 'rloc'. But, in the case where the complete picture is not present, the 'rloc' does not bring any information.

We believe such use case might be interesting, for example, extracting a tile as a single file. Therefore, we suggest modifying the specification as follows:
Replace:
"Each HEVC tile item shall be associated with one `HEVCConfigurationBox`, one `ImageSpatialExtentsProperty` and one `RelativeLocationProperty`. "
with
"Each HEVC tile item shall be associated with one `HEVCConfigurationBox`, one `ImageSpatialExtentsProperty`. Additionally, it shall be associated with one `RelativeLocationProperty` if its parent 'meta' box also contains the related image item."

The following note may also be added:
"NOTE: A conformant HEVC decoder may not be able to process the tile data without the data of the other tiles. Decoders may need to be modified to process the tile item data or the tile item data may need to be preprocessed to produce an equivalent conformant bitstream"

2.3 Typo and corrections to 14496-12: 'iloc' box

2.3.1 Typos

There are several spellings for data reference index in the 'iloc' semantics: "data_reference_index", "data-reference-index" and "data-reference index". They should be harmonized. Also the " data-reference table" is not clear.

There is an extra 'x' in the sentence "the first byte of the enclosing `MovieFragmentBox` x (as for …"

Mixed fonts are used for "extent_`offset`" and "extent_`length`" in 8.11.3.3

2.3.2 Editorial corrections in the 'iloc' box

The following sentence advances a confusing idea about "binary format":
"Placing this in binary format enables common handling of this data, even by systems which do not understand the particular metadata system (handler) used."

It should be rephrased as follows:
"This box provides lengths and offsets within a contained resource assuming that this resource is binary data, even if its actual item type indicates that it is textual. This enables common handling of any resource data, even by systems which do not understand the particular metadata system (handler) used."

The enumeration in the 'iloc' box talks about "absolute file offsets", "box offsets" or "item offset". This has several problems:
- the term "absolute" is not correct as indicated a few sentences below "The offsets are relative to a data origin."
- the term "box offsets" is not clear? Does this mean that if its value is N, one has to skip N boxes, whatever their lengths, to find the extent start? We do not think that was the intent. We think the intent was to say N bytes within the idat data field.
- the term "item offset" is similarly unclear.
We suggest replacing those terms with "byte offsets".

The sentence "the resource is formed by concatenating the extents" could be improved by adding "in the order specified in this box".

Finally, there should be a note indicating that when construction_method 2 is used, if one item needs to have an offset of 0, the base_offset field shall be set to 0.

3 Recommendation

We recommend clarifying the proposed aspects in the current specification, possibly via a corrigendum.