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Title **Clarification on ProducerReferenceTimeBox**
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1 Introduction

This contribution raises unclear points in the prft definition.

2 Discussion

Given the current specification of 'prft', it is unclear:

- what the value of media_time should contain: decode time, composition time, presentation time and if it corresponds to a real sample or not ?
- what the "relative wall-clock times" mean?
  what "a UTC time" is?

Our understanding of a production workflow is:

1) a frame is capture at wall-clock time T0
2) that frame is output from the encoder at wall-clock time T1
3) that frame is inserted in a movie fragment at wall-clock time T2, but the beginning of the generation of that movie fragment is Tx, potentially less than T1 or T0.
4) the movie fragment containing that frame is fully produced at wall-clock time T3.

Now that frame has a decode time, a composition time and a presentation time (taking edit lists into account).

We believe the following should be clarified:
- what is the production time of a movie fragment? when the prft is written or when the moof is finalized?
- What is the media time coded in the 'prft' box ?
- Which of the above wall-clock times is coded in the 'prft' box?

What is the purpose of this box?
- Is it used to measure the latency of the delivery (difference between UTC times when the fragment is produced and when it is received) ? In this case, the media time is not useful.
- Is is used to measure the latency of the system, from capture to display? In that case, the capture time is useful and relates to the presentation time. However, the capture time of a frame may not be easily available in the packaging entity, in every workflow.
- Is it used to act like a PCR in MPEG-2 TS, i.e. provides the clock variations at the server side? In this case, the composition or presentation times complicate the process.

In GPAC, we use it as follows. When a frame is captured, the UTC time is sampled. The 'prft' box codes the presentation (capture) time and the associated UTC time of the first frame in decoding order of the fragment. This allows us to measure the end to end latency of a delivery system. But, we do not believe this is an interoperable behavior.

Should we use versions/flags to distinguish between different modes ?

3 Misc

« This box is related to the next MovieFragmentBox that follows it in bitstream order. It must follow any segment type or SegmentIndexBox (if any) in the segment, and occur before the following movie fragment box (to which it refers). If a segment file contains any producer reference time boxes, then the first of them shall occur before the first MovieFragmentBox in that segment. »

The second sentence seems to paraphrase the first one. Remove redundant text.

4 Conclusion

We recommend clarifying this box, possibly issuing a COR to ensure proper use of this box.