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CODING OF MOVING PICTURES AND AUDIO**

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Title: Requirements for a Simple Scene Description Format
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Rationale

During the last 6 months, we have tried, within the BIFS Low Complexity activity to adapt the current Systems specification in general and the BIFS specification more specifically to the requirements of simple mobile applications (See doc. m9790 for these requirements). The major outcome of this work is that, despite the proposed tweaking and twisting to maintain backward compatibility with BIFS, those requirements remain hard to meet:

- the BIFS decoder is big in terms of code size;
- the BIFS decoder is slow because it requires floating point operations;
- the BIFS scenegraph is big in terms of memory foot print and code size;
- the BIFS encoding performs less well than simpler codes in this environment.

All these assertions have been documented in previous MPEG documents and are gathered in companion document m10097.

In addition, we discovered that there is no simple way in Systems of packing audio/video/graphics elements into simple aggregated packets suitable for interactive applications that do not require the heavy infrastructure of streaming protocols and for which an MP4 packing would be an overkill.

As a result, we request MPEG-4 to start a new work item on Advanced Scene Coding (ASC) and Simple Aggregation Format (SAF) and we propose the following technical requirements for those new technology.

Note: The purpose is not to throw away all past specifications and experiences acquired in the last years in BIFS and Systems, but rather to re-examine existing features in the light of those new requirements, and decide of their inclusion / substitution / removal based on solid Implementation Study.

If this work item is adopted, we also request MPEG to adopt and follow a very strict standardization process in order to deliver a standard that would be fully demonstrated, implemented and crosschecked by FDIS time.

Requirements

Requirements for ASC

1. The ASC decoder and compositor code shall be as small as possible.
2. The ASC decoder and compositor runtime memory footprint shall be as small as possible.
3. The ASC decoder and compositor code shall be as fast as possible.
4. ASC decoding complexity and memory footprint shall be optimally balanced with compression efficiency.
5. An integer-only implementation of ASC decoding and rendering shall be possible.
6. The ASC object set shall allow small profiles definition.
7. There shall be separate ASC streams for 2D and 3D.
8. The ASC object set shall be as generic as possible to allow an easy conversion of other graphics formats to MPEG-4.
9. The ASC encoding shall be extensible in an efficient manner.
10. The ASC encoding modes shall be easily reconfigurable and signalled in band;
11. The ASC format shall allow the representation of scalable scenes.
12. The ASC format shall allow the representation of error-resilient scenes.
13. The ASC format shall allow the representation of adaptable scenes, in the MPEG-21 meaning.
14. It shall be possible to implement the ASC decoder and/or renderer at least partially in hardware.

Requirements for SAF

1. The ASF shall provide a simple aggregation mechanism for Acces Units for various media (Audio, Video, Graphics);
2. The ASP shall allow a synchronized presentation of the various media elements in a packet or a sequence of such aggregated packets;
3. The ASF shall be as bit efficient as possible;
4. The ASF shall be byte aligned;
5. The ASF shall be easily transported on popular interactive transport protocol (eg. HTTP);
6. The ASF shall be easily mapped on popular streaming protocol (e.g. MPEG-4 RTP payload format).

Standardization Process

Proposed Guidelines for Standardization

In addition to the usual MPEG process for standardization, we are suggesting the following guidelines that are aimed to give focus to the standardization process and hopefully lead to a simple and useful standard:

1. A ***limited*** set of target applications shall be defined upfront the standardization process and guide the technical requirements;
2. Sample target content shall be provided for each application upfront the standardization process;
3. Target applications shall be simple and cheap to author and encode. The following applications are suggested as a first set:
 - a. Audio & video plus subtitles;
 - b. Play lists;
 - c. Still vector images;
 - d. Karaoke;
 - e. Slide show;
 - f. Cartoons;
 - g. Tickers;
 - h. Portals.
4. Proponents of technology shall provide source code together with their technical contribution for scrutiny by the Implementation Study Group;
5. Each feature shall be tested and fully implemented within reference software before its acceptance into the standard.

Proposed Time Frame for Standardization

We propose to adopt the following time line of standardization:

2003-10 : Draft Call for Proposal

2003-12 : Call for Proposal

2004-03 : WD

2004-07 : CD

2004-10 : FCD

2005-03 : FDIS