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Title Usage of DASH in GPAC (demo)
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1 Introduction

This document presents the demonstration made during the 95th MPEG meeting, showing the usage of DASH in the Open Source Project GPAC [1], in conjunction with other MPEG technologies such as MPEG-4 BIFS, MPEG-2 TS and MP4. The GPAC project proposes three tools relevant for DASH:

- MP4Box, a command line tool for creating ISO-based DASH content
- MP42TS, a command line tool for creating MPEG-2TS-based DASH content
- The players (Osmo4, MP4Client, ...) capable of playing back DASH content

2 Creating MP4-based DASH content

The GPAC well-known command-line tool called MP4Box has been extended to support generation of DASH content.

The usage is as follows to create 10s segments, with 5 fragments per segment:

```
MP4Box -dash 10000 -frags-per-sidx 5 -segment-name output_seg  
file.mp4
```

3 Creating MPEG-2 TS based DASH content

A new tool called MP42TS has been added to the GPAC project. This tool is capable of producing MPEG-2 Transport Stream from MPEG-4 input content. In particular, it supports input MPEG-4 content from an MP4 file or from a streaming session (SDP input). It also supports on-the-fly encoding of MPEG-4 BIFS content and generation of T-DMB compliant streams. Its output can be:

- A single TS file
- A TS delivered over UDP or RTP, unicast or multicast
- Several TS segment files and an associated M3U8 file

Note: the MPD output should be available soon.

Its usage can be as follows for simple generation from an MP4 file:

```
MP42TS -prog=file.mp4 -rate=4000 -real-time -dst-file=file.ts
```

A more complex usage for encoding T-DMB content (including carousel generation every 10 seconds), generating updates and creating HTTP streaming compatible content:

```
MP42TS -prog=base_scene.bt -src=scene_update.bt  
-mpeg4-carousel=10000 -rate=400 -real-time -segment-duration=5  
-segment-manifest=playlist.m3u8 -segment-http-prefix=prefix  
-segment-number=5 -dst-file=segment.ts -dst-udp=224.0.0.0:6666  
-audio=http://icecast.example.org/radio1.aac  
-video=radio_logo.h264
```

4 Playback of DASH Content

The different players from the GPAC project, whether on PC, iOS devices or Android devices, are capable of playing back DASH content. This is done by means of a plug-in called “MPD_in”.

Playback has been tested with MPD and M3U8 manifests and with MP4 and MPEG-2 TS segments. In case of M3U8, an automatic conversion from M3U8 to MPD is done on the fly and the MPD is then processed.

Some long running tests have been performed with publically available M3U8 sources such as France 24 [2] and others. Other tests have been performed with GPAC generated M3U8 (see Section 3). A demo video, showing GPAC usage of DASH for playback of Digital Radio Services on iPad, is available on YouTube [3].

5 Conclusion

This demo shows how diverse MPEG technologies can be mixed in the context of DASH. All the aspects of the demonstration can be reproduced using the GPAC tools, which can be downloaded in source code from the GPAC SVN server.

6 References

[1] The GPAC Open Source project, <http://gpac.sourceforge.net>

[2] France 24 HTTP Streaming URL, http://stream7.france24.yacast.net/iphone/france24/fr/f24_fr.m3u8

[3] GPAC demonstration of DASHed Digital Radio Services on iPad, <http://www.youtube.com/watch?v=Bmer91TZhCo>