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DVB-MABR (Multicast Adaptive Bitrate streaming) Verification & Validation

Work sponsored by DVB

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About

Romain Bouqueau

- Developer, Open Source and Open Standard advocate
- Contributor to GPAC since 2007
- CEO and founder of Motion Spell

GPAC

- Open Source Multimedia Framework: modular & standards compliant
- Open source since 2003. 1 million lines of code; $14m in investment
- Large international community of contributors
- A leader in packaging, it provides tools to process, inspect, package, stream, playback and interact with media content
- Lead by a team of experts, with roots in research & standardization
- Licensed under the GNU LGPLv2.1 or later

Motion Spell - Professional services provider based on GPAC.

- Consulting, custom integrations & developments,
- Training and support and solutions based on GPAC (conformance, subtitling)
- Motion Spell is also the exclusive commercial licensor of GPAC.

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What We'll Cover

DVB MABR

- Why multicast
- What is DVB MABR

Why GPAC was a good fit

- Brief Overview

DVB MABR Tool for V&V (verification and validation)

- A custom application that leverages GPAC
- Setting Up a MABR Session
- Leveraging communities

DVB MABR

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Why multicast?

- **Purpose**: scale delivery when many users need the same content
- **History**: used with MPEG-TS (IPTV, …) but needed adaptive streaming
- **DVB**: open standard

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GPAC's FLUTE implementation: DVB mABR

Overview of DVB MABR specification

- Implemented in May 2024 (server + client)
- Low latency support
- Repair implemented
- Continuous integration, tests and improvements are undergoing.

How?

Leveraging FLUTE

- **Purpose**: Protocol for efficient file delivery over unidirectional networks
- **RFC**: Defined in RFC 6726 (previously RFC 3926)
- **Applications**: Multimedia broadcasting, satellite, and IP-based TV where multicast file distribution is ideal

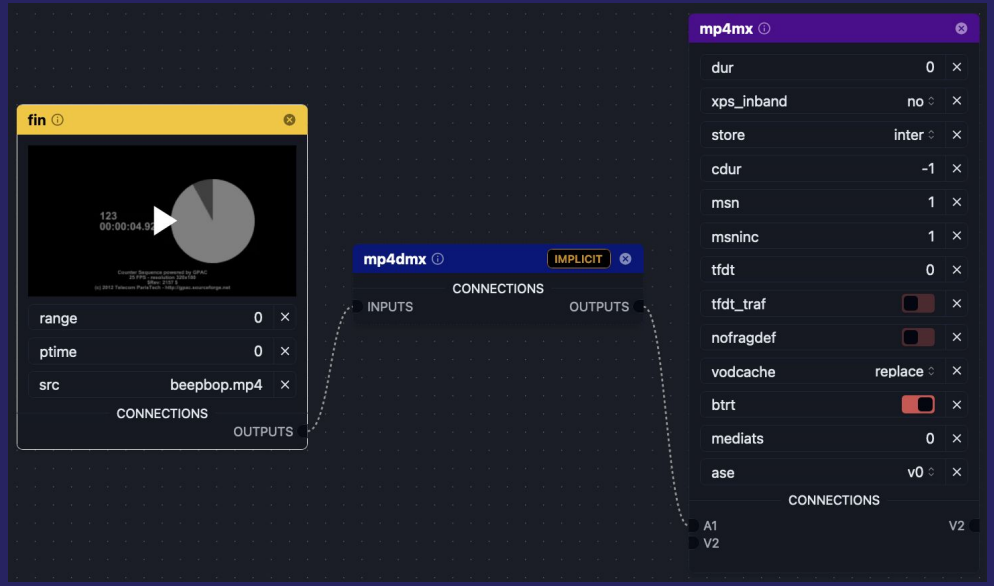
More at https://wiki.gpac.io/Howtos/route/

Need for some V&V (verification and validation)

- DVB MABR server
- DVB MABR gateway
  - Relay MABR to HTTP: re-expose MPEG-DASH
-
- Motion Spell built:
  - Custom Python app to configure: https://github.com/MotionSpell/DVB-MABR-Tool/
  - Launches GPAC library via the Python API

GPAC

GPAC general architecture



- Modularity
- Standard compliant
- Capabilities
- Customisation
- API

Example gpac filters: dasher, avgen, mp4mx, mp4dmx, httpin, httpout, route_in, route_out.

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Trying and validating your DVB MABR implementation

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The tool

Welcome to the DVB-MABR Validation Tool.

The repository contains a Python script (`app.py`), a configuration file (`config.ini`), and three scripts for launching the application in the different modes described in the DVB's RfP a/o the V2V (Verification and Validation) document.

Description

The Python script `app.py` is designed to configure and run a media processing application using the GPAC library. It loads configurations from the provided `config.ini` file and/or from the command-line, processes command-line arguments, and initiates the media processing session accordingly. The application can run in two modes: server or gateway.

Requirements

- Python 3.x
- GPAC library (libgpac.so/.dll/.dylib):
  i. installed with a prefix detected by `pkg-config` and
  ii. accessible from your shell (Windows: `export PATH=` ; Linux: `export LD_LIBRARY_PATH=` ; MacOS: `export DYLD_LIBRARY_PATH=`)
- A MPEG-DASH player (GPAC (`gpac -play http://127.0.0.1:8080/Manifest.mpd`)), dash.js, Theoplayer, ...) for viewing the stream (optional)

```
./run_servers.sh
```

Then choose which TAD stream to execute:

```
Choose a stream source:
A: Live segment template without manifest updates
B: Live segment template with manifest updates every 30s
C: Live segment timeline with manifest updates every 30s
D: Multi-period, 1 period per minute
E: low-latency single rate
F: low-latency multi rate
```

then run this command

```
./scripts/launch_gateway.sh
```

https://github.com/MotionSpell/DVB-MABR-Tool/

DVB mABR : typical command-lines

Setting Up a FLUTE Session in GPAC

- **Server command:**

  gpac -i https://livesim2.dashif.org/livesim2/testpic_2s/Manifest.mpd dashin:forward=file -o mabr://234.1.1.1:1234 -logs=route@info

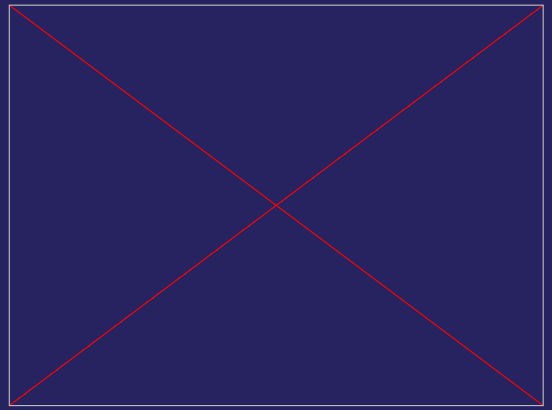
- **Gateway command:**

  gpac -i mabr://234.1.1.1:1234 dashin:forward=file -o http://localhost:8080/:rdirs=gmem:reqlog='*':cors=auto -logs=route@info --max_cache_segs=40

- **HTTP Client :** gpac -play http://127.0.0.1:8080/Manifest.mpd

DVB MABR

DVB MABR Playback and Gateway Setup examples



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Leveraging communities

- The Python app allows to quick start and configure:
  - https://github.com/MotionSpell/DVB-MABR-Tool/
- Playback with **dash.js** is documented
- Presentation at **5G-MAG** on Nov 8th 2024

Personal notes:

- We exist as an ecosystem
- We need to consider project lifetime: GPAC will be maintained without any funding, the DVB tool may not

More Info

Thank you DVB and OSMART!

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