

## INTRODUCTION

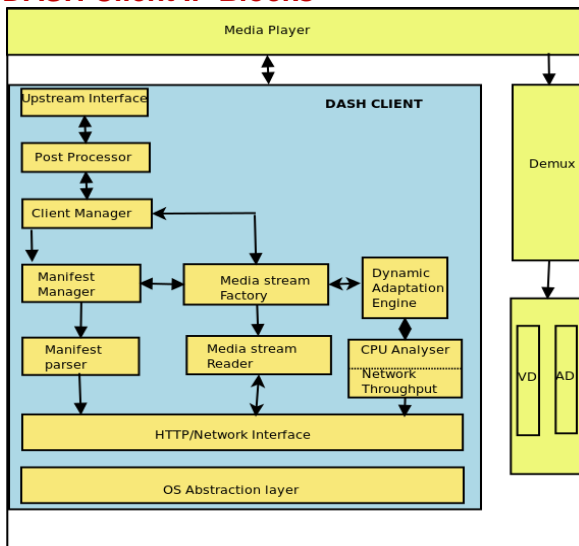
Vayavya Labs has introduced adaptive streaming client solution based on MPEG DASH (Dynamic Adaptive Streaming over HTTP) specification. DASH Client solution is a portable solution on streaming device (Digital TV, STB, hand-held) implemented in ANSI C standard.

It acts as a source element for video-audio data during its integration with any media player.

Key highlight of solution are:

1. Efficient stream switching engine
2. Optimized usage of OS resources
  - o Single thread implementation.
  - o Executes in media player thread
3. Internal buffer allocation for fMP4 on-demand profile only
4. No memcpy() inside core implementation
5. SSL support for content protection

## DASH Client IP Blocks



6. Media player integration through upstream interface module
7. Enablement of Ads insertion using post processor module for PID modification
8. Well defined algorithms to calculate network bandwidth
9. Codec agnostic design

10. Works with all codec in platform
11. Flexibility of using switching algorithm
  - o based on network bandwidth & CPU load switch or quick switch
12. Playback support for both the file formats: MPEG TS and fMP4
13. Profile supported
  - o Main and Simple in TS file format
  - o Main and on-demand in fMP4 file format
14. Support for live and on-demand streaming format

## KEY DIFFERENTIATION

- Efficient stream switching algorithm
- No open source code, hence no licensing worries
- Portability across platforms, suitable for STB/DTV and other streaming device
- Memory efficient. On demand loading to optimize memory consumption.
- Minimal OS usage.(single thread used)
  - o static footprint of less than 260Kb
  - o dynamic footprint of ~ 2Mb
- Playback support available in both modes of request, byte range and url based request
- Ability to use OSS as well as non OSS libraries for standard components like XML, HTTP provided by platform
- Plug & Play on media framework like GStreamer
- Available on ST Micro and Raspberry pi platform
- Intelligent bandwidth switch algorithm that does not change the bit-rate too often in fluctuating bandwidth changing conditions
- TS playback using platform demux and fMP4 using pluggable demux
- Ability to use any 3rd party demux
- Supports any 3<sup>rd</sup> party DRM by sending signalling information from MPD to DRM framework using generic APIs

## VALIDATION OVERVIEW

Validation strategy and execution environment is deployed for robust quality assurance.

Interoperability tests are covered to test against other streaming specification like AHLS

Solution is benchmarked with libDASH for startup time at different bit rate.

## TEST SET UP

Vayavya has set up complete lab infrastructure to validate adaptive streaming before delivering on customer platform.

Ready validation tools are;

1. Stream generation tools for creating multiple bit-rate streams at different encoding rates
2. Tools for manifest files creation according to different DASH profiles
3. Bandwidth shaper tool for network bandwidth simulation
4. Comprehensive product test specs from field & lab
5. Test coverage to validate DASH functionality

## CONTACT

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## ROAD MAP

- Support of full profile
  - Maturation of On-Demand profile for fMP4
- Support of trick modes like seek for fMP4 playback
- Integration with Android using Nuplayer
- Support HbbTV and TNT specification requirement