Tiled-based Adaptive Streaming using MPEG-DASH

Context

- Large adoption of HTTP Adaptive Streaming technologies such as MPEG-DASH
- UHD videos still hard to stream in bandwidth-limited networks, even with HEVC
- Video Tiling can offer more options for Adaptive Streaming of UHD videos

Demonstration Concepts

- Use standard MPEG-DASH player and content
- Describe tiled videos in an adaptive streaming manifest, based on a grid
  - Support for MPEG-DASH Spatial Relation Description SRD
- Configure the client with the relative priority of each tile in the grid
  - Various priority strategies: row-based, column-based, center based or edge-based degradation of tile quality

- Use of generic algorithm to allocate max rate per tile based on tile priority
  - Compute current throughput and set all tiles to minimal quality
  - Maximize quality for all tiles of same priority, starting from most important priority and derive max bitrate per tile

- Use unmodified rate adaptation algorithm for each tile with computed bitrate

Results

- Open source player, open source packager and test sequences available at http://gpac.io
  - Codec-independent tiling: 1 decoder per video
  - HEVC Motion Constrained Tile Sets: Single decoder needed

Future Work

- New Rate Adaptation Algorithms
- Viewpoint Adaptation: 360°video, ROI
- Service acceptability