Thumbnails for dash.js

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Two main approaches

- ▶ 1. Trickplay tracks
  - ▶ Low framerate tracks
- ▶ 2. Additional jpeg resources
  - ▶ Outside standard, but can be specified by DASH-IF
- ▶ Pros and Cons
  - ▶ Trickplay Tracks
    - ▶ + can be encrypted, and used for fast forward
    - ▶ - require video decoder
  - ▶ Jpeg resources
    - ▶ + Easy to implement in browsers for extended scrub bar
    - ▶ - Cannot be protected using DRM
- ▶ We need both!
- ▶ Goal:
  - ▶ Make a common manifest syntax for JPEG thumbnails in DASH-IF

Proposals for JPEG tracks

▶ 1. Google/Shaka-Player had proposal using individual images

▶ 2. BBC example uses tiles (25 pictures per tile)

▶ See https://github.com/Dash-Industry-Forum/DASH-IF-IOP/issues/119

▶ For wide acceptance, good to handle both

▶ Initial Suggestion (see next page)

  ▶ Use tiles but let people use 1x1 tile to make individual images (good for live)

Initial suggestion

```
<AdaptationSet id="3" mimeType="image/jpeg" contentType="image">
  <SegmentTemplate media="$RepresentationID$/tile$Number$.jpg" duration="125" startNumber="1"/>
    <Representation bandwidth="10000" id="thumbnails" width="6400" height="180">
      <EssentialProperty schemeIdUri="dashif.org/thumbnail_tile" value="25x1"/>
    </Representation>
  </SegmentationTemplate>
</AdaptationSet>
```

Comments:
- Duration tells duration of tile
- width and height are resolution of the tile (max jpeg resolution is 64k x 64k)
- Value of EssentialProperty is the number of thumbnails (horizontal x vertical)
- Duration of each thumbnail is tile_duration/nr_of_thumbnails
- Size of thumbnail is derived from tile resolution
- Last tile may have thumbnails outside time interval (add black thumbnails or possibly make smaller tile)
- Only equidistant thumbnails
- Multiple resolutions (representations) can be used (see BBC's example)

Proposal for next steps

- Add proposed design to github for discussion
    - E.g. markdown document in DASH-IF-IOP
- People can make pull requests for changes
    - Others can comment on pull requests
- Implementation in dash.js some time early 2017?
- Comments?