Brainstorm on video coding standards

MPEG Strasbourg

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Orange and video codecs

- Video traffic
  - IPTV (ADSL, fiber), mobile TV (3G-4G)
    - dedicated STBs
    - Xbox, PS3-4
    - mobile devices
  - OTT applications
    - via PC, tablet, connected TV, STBs
  - ISP traffic: video is the main usage of data

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Orange and video codecs

- Main operator criterions
  - compression efficiency: to optimize bandwidth (CAPEX)
  - codec perinnity: low renewal of STBs (5 years & more) (CAPEX)
  - service platform interoperability: limit the number of format (OPEX & CAPEX)
  - hardware implementation avaibility (energy consumption)
  - standardized solution: allow to have competitive solutions
- life cycle of a codec is rather long: typically 5-10 years
  - it took 4 years to get AVC
    - HEVC may come faster…? but still 3 year?
- Today nearly all services are using AVC
  - some experiments made with HEVC
    - OTT VOD with HEVC: CES 2013 with Samsung
    - Real time HEVC HD encoding & streaming – Roland Garros 2013
    - NAB, IBC 2014: 4K format & HEVC
Brief recall of video format & codec evolution

A new standard is associated to a new format…

Evolution of formats and associated bit-rates

- VHS
- SD
- HD
- UHD 4K

Year


Bit-rate in Mb/s

10000 1000 100 10 1

- raw bit-rate (ie. without compression): x4 (up to x10) every 10 ans
- after compression, and operational optimisation [with respect to industrial implementation]:
  1 new format = x3 in bit-rate at the introduction x1.5 with enhanced encoders
- a new format every 10 years

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Foreseen video format & codec evolution
Will there be formats with more pixels?

- TV scenarios
  - Limited QoE improvement of 4K resolution
    - for usual test viewing conditions (1.5H)
Will there be formats with more pixels?

- Tablet scenarios

- For a 10 inch tablet, 720p resolution is as good as Full HD
A new format?

- beyond resolution: color & fluidity improvements
  - color: Wide Color Gamut & High Dynamic Range
    - HDR: what precision required…
      - is 10 bit sufficient?
  - fluidity: High Frame Rate
    - 100Hz provide more accurate image (see 4EVER demo @ IBC)
      - to be further evaluated
    - => may be not sufficient for a new standard (see HEVC High-10…)

- about resolution
  - to get higher resolution (8K or more)
    - new use cases with larger field of view
      - telepresence, collaborative work, …
        - caution: are these critical contents?
    - movie, TV:
      - grammar production has to be revisited or…
Further requirements for a new video codec

- Complexity could become prior requirement
  - video as a communication media for IoT (car, surveillance, AR, …)
  - codec should be low complexity implementation, low power consumption

- Software implementation
  - Moore law is still valid, software codecs implementation may become reality in 8-10 years

- Licence model
  - still needs for a performing codec for premium services
  - for video that do not require further compression efficiency
    - codecs with lower licence fees could be consider
      - although licence may not have the most impact for an operator
Wrap-up

1- How much additional compression (compared to HEVC) do you foresee to be needed for your market(s)? what are the desirable frame rates & resolutions?
   - 50% bit-rate reduction still desirable
   - mobile: 720p (to 1080p) for local display, higher for remote display
   - TV: 4K@100Hz, 10-12 bit depth

2- What should be « the bar » to surpass to make a new standard?
   - 50% bit-rate reduction

3- How would it affect your business (and in what time frame) if a new video codec would deliver 25% reduction in data rate wrt HEVC?
   - marginal impact (see hardware implementation, and associated life cycle)
   - may emerge on some transient market with short hardware lifecycle or software able implementations
Wrap-up

- **4-** Do you see market segments where HEVC may not be successful due to lack of functionality?
  - no.
    - IoT market could start with AVC solutions due to lower cost/complexity, but will switch to HEVC with implementation maturity

- **5-** What will be the applications with highest amount of video data delivery 5-10 years from now?
  - TV services (live, TVOD, VOD), UGC (YouTube, DailyMotion, …), social applications (Snapchat, …)
  - Super Multi-View video still experimental

- **6-** What would change if the new codec is (partly or totally) royalty-free?
  - Moderate impact (licence cost is not necessarily the main factor)
    - still some questions of the assertion of the effective licence-fee, codec with a patent-pool offer a clearer statement
thanks