

Brainstorm on video coding standards

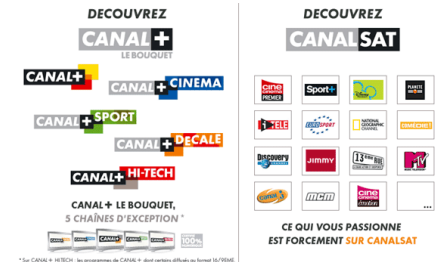
MPEG Strasbourg

Stéphane PATEUX – ORANGE/IMT/OLR/CED
2014-10-21, presentation to MPEG group



Orange and video codecs

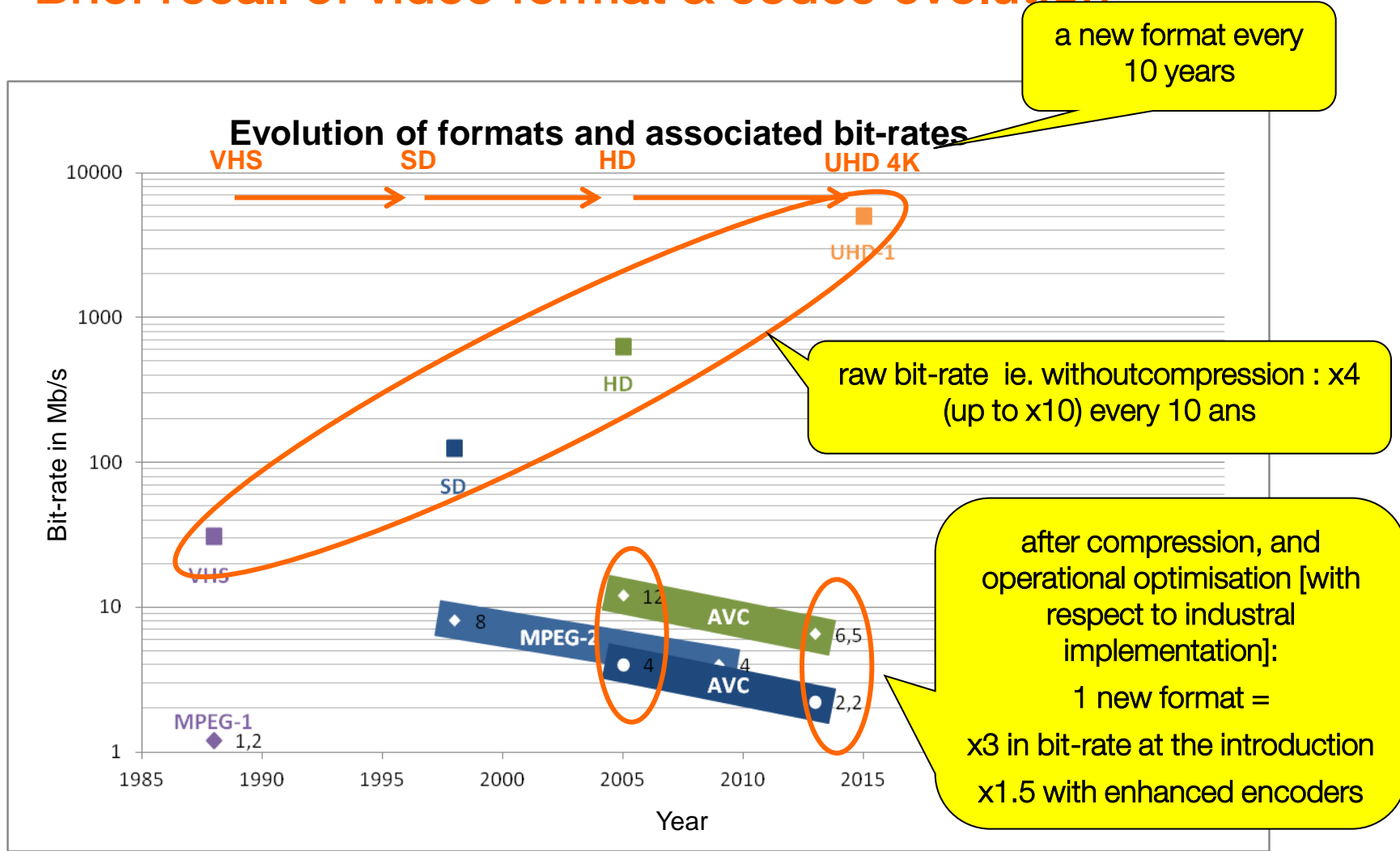
- Video traffic
 - IPTV (ADSL, fiber), mobile TV (3G-4G)
 - dedicated STBs
 - Xbox, PS3-4
 - mobile devices
 - OTT applications
 - via PC, tablet, connected TV, STBs
 - ISP traffic: video is the main usage of data



Orange and video codecs

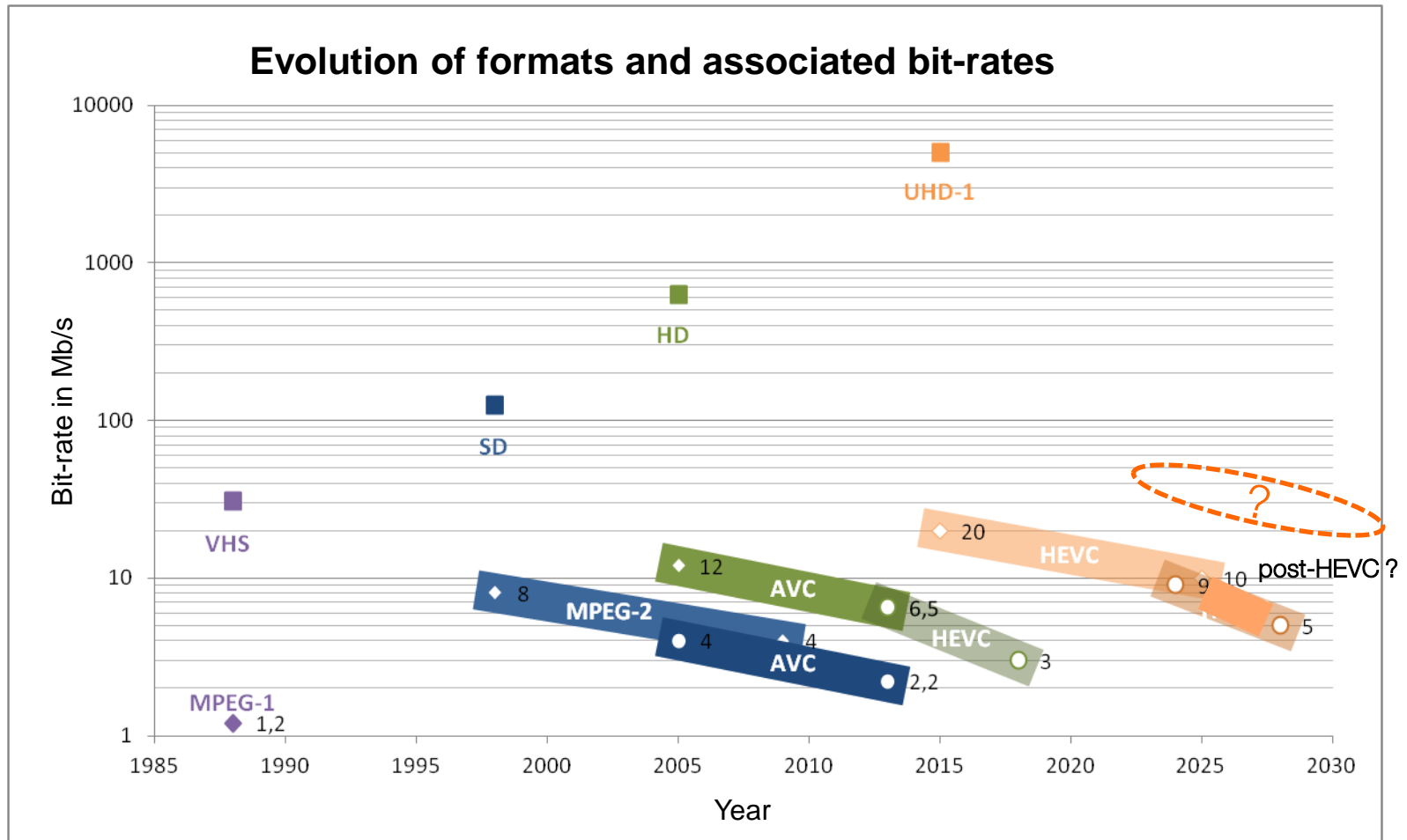
- Main operator criterions
 - compression efficiency: to optimize bandwidth (CAPEX)
 - codec perininity: low renewal of STBs (5 years & more) (CAPEX)
 - service platform interoperability: limit the number of format (OPEX & CAPEX)
 - hardware implementation avaibility (energy consumption)
 - standardized 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



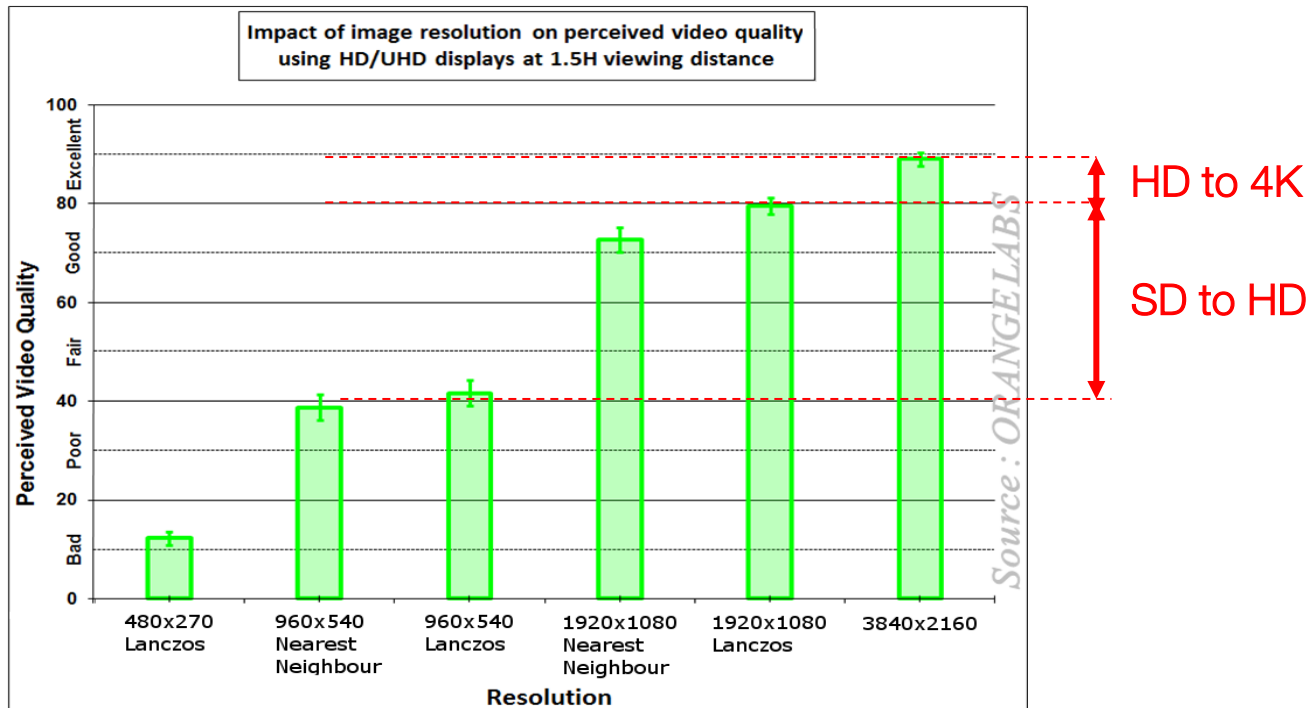
A new standard is associated to a new format...

Foreseen video format & codec evolution



Will there be formats with more pixels?

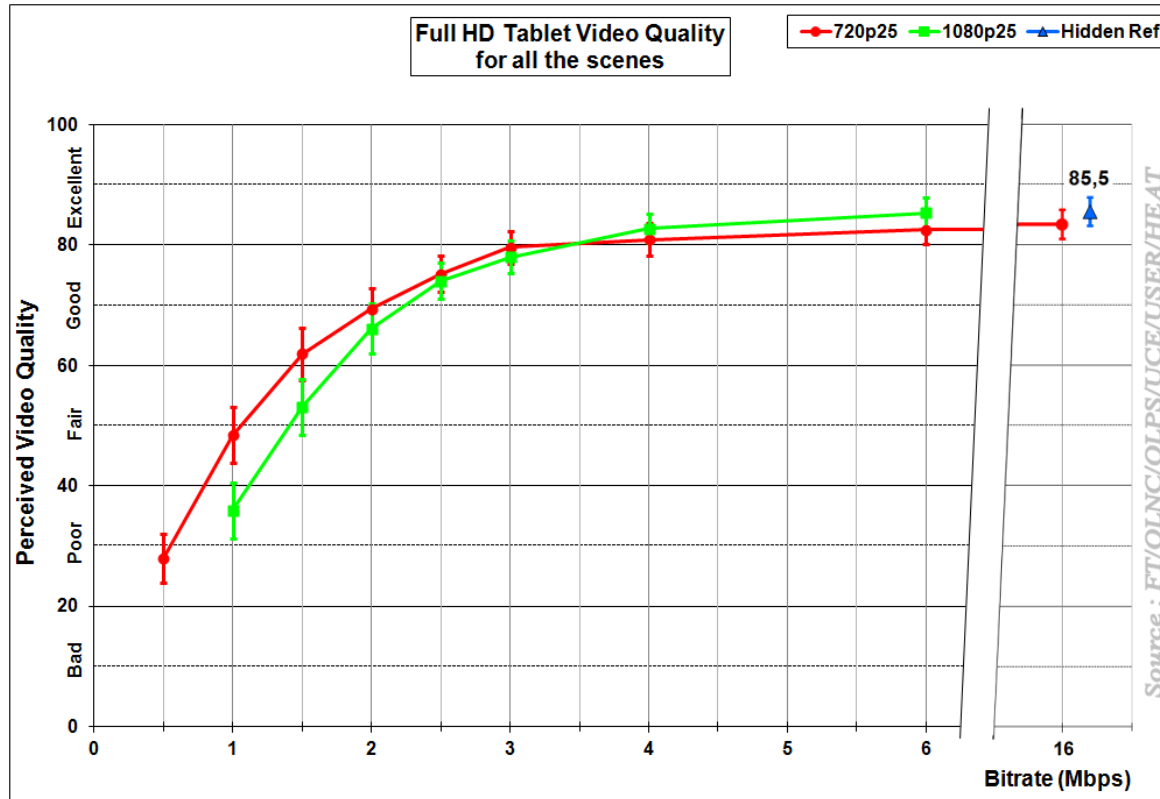
- TV scenarios



- 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

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