Overview of HEVC/H.265 Transfer Syntax Supplement 195

DICOM WG4/13 HEVC ad-hoc group
November 8th, 2016
Video coding standards history

  - Supplement #40
  - Supplement #149 and #180
- HEVC (2013): Proposed for standardization into DICOM today
Domain of application

- Encode single or multi-frame video content
- Can be used instead of AVC or MPEG-2
- Should be used to compress the size of DICOM video data
- For compression of video of up to 4k resolution and frame rate of 60fps
- Main 10 profile usable for HDR and WGC content
Needs for HEVC

• Smartphones compatibility
  o HEVC content is already created
  o As of now, need transcoding to be used in DICOM

• Higher compression efficiency
  o For optimized usage of server space and network bandwidth
Differences between AVC and HEVC

• More efficient
  o Doubled compression rate

• More complex
  o Supported by off the shelf hardware and software

• Compression artifacts less obvious
  o Less “blockiness”
Proposed HEVC profiles

- HEVC has one profile per type of video

- Supplement 195 proposes support for 2 profiles:
  - HEVC Main profile with level 5.1
    - 4:2:0 content
    - Up to 8 bit depth
  - HEVC Main 10 profile with level 5.1
    - 4:2:0 content
    - Up to 10 bit depth
  - Both for videos with up to 4k resolution at 60fps
Proposed standardization

• No new SOP Classes or IODs

• Addenda to 6 parts of DICOM

• 2 new transfer syntaxes
  o HEVC Main profile
  o HEVC Main 10 profile

• Essentially similar to AVC transfer syntaxes
  o Support for audio stream to be encompassed
Availability of HEVC codecs

- Market is already set up for HEVC 4:2:0 chips
- New smartphones already support HEVC
Licensing issues (1/2)

- Fujitsu has no patent pertaining to the inclusion of HEVC inside DICOM
- HEVC is associated to 2 patent pools known to the Editor of this supplement. No claims to the comprehensiveness of the following list. This is not intended as legal advice:
  - 1) MPEG-LA patent pool:
    - Licensing fee only for hardware/software
    - Not per stream
Licensing issues (2/2)

2) HEVC Advance
   - New patent pool // Controversial and criticized
   - Payment per stream IF stream is sold or rented to a customer