Frame Deflate TS

DICOM WG 4

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Single bit (bi-level) image pixel data

- Most commonly used for BINARY SEG bit-planes
  - small number of frames
  - very large number of frames, e.g., SEG of whole slide imaging high-res layer
- Can theoretically be used for other image applications
- Historically addressed be specific compression schemes
  - JBIG, JBIG2
  - Group 4 Fax
- No dedicated DICOM bi-level image Transfer Syntaxes
- Some existing Transfer Syntaxes like J2K support bi-level theoretically

Deflate

- Already defined for entire dataset
  - not practical for random access to very large number of frame
- Need intra-frame Transfer Syntax adequate for bi-level
  - deflate is sufficiently good without being ideal
  - serves in lieu of dedicated bi-level schemes with poor support/license issues
- Allows DICOMweb frame level access to compressed WSI SEG tile
  - propose to use as Content-Type, so stored and indexed that way
  - not Content-Encoding (on-the-fly compress/decompress at lower layer)

Example

- Deflate is simulated within zip on pbm (negligible header) format
- Given 4,500,000 byte input WSI 40x SEG bi-level image
- Reduced to 1,224,130 = 3.68 compression ratio
- cf. 3.27 using J2K, 3.80 using bzip2 and 10.6 using JBIG
- obviously not as good as JBIG, latter not widely available, esp. in browsers
- simpler and faster than J2K