DCMTK - Feature #1104

Replace IJG in DCMTK with libjpeg-turbo as an external library

2024-01-24 16:39 - Marco Eichelberg

Status:	New	**Start date:**	2024-01-24
Priority:	Normal	**Due date:**	
Assignee:		**% Done:**	0%
Category:		**Estimated time:**	0:00 hour
Target version:			
Module:	dcmjpeg	**Compiler:**	
Operating System:			

Description

The most recent versions (>=3.0.0) of libjpeg-turbo have added support for lossless compression.
To this end, libjpeg-turbo has added new bitwidth-prefixed functions to their API:
https://github.com/libjpeg-turbo/libjpeg-turbo/blob/3.0.1/libjpeg.txt#L114

Here is a hacky proof-of-concept patch to enable libjpeg-turbo support in DCMTK:
https://github.com/kevle/vcpkg/blob/dcmtk-remove-vendored-jpeg/ports/dcmtk/use_jpeg-turbo.patch
This patch has been tailored for vcpkg, so some changes to the CMake files might not apply to DCMTK build system considerations.

From what I can tell, functional patches made to the original ijg-libjpeg + lossless library DCMTK uses, to properly support DICOM, fall into the following categories:

- Querying the lossless flag during decompression for color space guessing
- Inserting SOF1 markers instead of SOF0 markers when using transfer syntax 1.2.840.10008.1.2.4.51 and 8-bit coding
- Predictor 6 workaround
- Cornell bug workaround
- Safety checks using internal libjpeg data structures to determine whether start_compress has already been called

Of those, only the SOF1 marker thing might be difficult to achieve with libjpeg-turbo without modifications upstream. I do not know whether the “Predictor 6” and “Cornell bug” workarounds are still relevant.

Feature request and patch provided 2024-01-23 by Kevin Leonardic <kevin@leonardic.de>.