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**Information technology — JPEG 2000
image coding system: Reference
software**

**AMENDMENT 2: Additional reference
software**

*Technologies de l'information — Système de codage d'images JPEG
2000: Logiciel de référence*

AMENDEMENT 2: Logiciel de référence supplémentaire

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The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

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Information technology — JPEG 2000 image coding system: Reference software

AMENDMENT 2: Additional reference software

Page 6, Clause 6

Replace:

“Two independent and separate software source trees are provided. These are:

- **JASPER.ZIP**, provided as indicated in the file **COPYRIGHT**, contained within the zip file. This is written in the C programming language, and should compile and run on any platform with a C language implementation conforming to ISO/IEC 9899:1999, and supporting a subset of the POSIX C API, ISO/IEC 9945-1:1996.
- **JJ2000.ZIP**, provided as indicated in the file **COPYRIGHT**, contained within the zip file. This is written in the Java™ programming language, and executes under versions of the Java Virtual Machine (JVM) from version 1.1.1 onwards.

The supplied executables are described briefly in Clause 8, and in more detail with some information about the supplied source code in Annex A (JasPer) and Annex B (JJ2000).

Both distributions have been tested as meeting the coding and decoding requirements for codestreams identified in ITU-T Rec. T.800 | ISO/IEC 15444-1. Formal compliance is beyond the scope of this Recommendation | International Standard.”

by:

“Three independent and separate software source trees are provided. These are:

- **JASPER.ZIP**, provided as indicated in the file **COPYRIGHT**, contained within the zip file. This is written in the C programming language, and should compile and run on any platform with a C language implementation conforming to ISO/IEC 9899:1999, and supporting a subset of the POSIX C API, ISO/IEC 9945-1:1996.
- **JJ2000.ZIP**, provided as indicated in the file **COPYRIGHT**, contained within the zip file. This is written in the Java™ programming language, and executes under versions of the Java Virtual Machine (JVM) from version 1.1.1 onwards.
- **OPENJPEG.ZIP**, provided as indicated in the file **LICENSE**, contained within the zip file. This is written in the C programming language, and compiles and runs on any platform with a C language implementation conforming to ISO/IEC 9899:1999 (aka C99).

The supplied executables are described briefly in Clause 8, and in more detail with some information about the supplied source code in Annex A (JasPer), Annex B (JJ2000), and [Annex C](#) (OpenJPEG).

These three distributions have been tested as meeting the coding and decoding requirements for codestreams identified in ITU-T Rec. T.800 | ISO/IEC 15444-1. Formal compliance is beyond the scope of this Recommendation | International Standard.”

Page 6, Clause 7

Replace the last paragraph:

“The two distributions have differing copyright and licensing restrictions, which reflect the different requirements and operating environments of those organizations that have contributed to the development of the software.”

by the following:

“The three distributions have differing copyright and licensing restrictions, which reflect the different requirements and operating environments of those organizations that have contributed to the development of the software.”

Page 6, Clause 8

Replace the first paragraph:

“Both reference software implementations have been successfully built on a variety of operating platforms and with a selection of compilers. They have been written with portability and comprehensibility in mind. Platforms for which there is specific installation documentation are indicated below”:

by:

“The three reference software implementations have been successfully built on a variety of operating platforms and with a selection of compilers. They have been written with portability and comprehensibility in mind. Platforms for which there is specific installation documentation are indicated below”:

Page 7, Clause 8

Add a new [subclause 8.3](#) as follows:

8.3 OpenJPEG requirements

OpenJPEG has been successfully compiled on a variety of platforms, including Windows XP, Windows Vista, Windows 7 and Windows 8, Mac OS X (up to 10.9, 32 and 64 bits) and Linux (Ubuntu and Debian). OpenJPEG uses CMake, a cross-platform build system, to configure, build and test the library and executables on the supported platforms.

Page 7, Clause 9

Replace:

“Both sets of reference software offer the capability to encode and decode codestreams and JP2 files that conform to the syntax defined in ITU-T Rec. T.800 | ISO/IEC 15444-1:2003.

For transcoding to other image formats or for display, both sets of reference software allow the user to assume in the absence of additional information that decoded codestream components are in the sRGB colour space or sRGB based greyscale.”

by:

“The three sets of reference software offer the capability to encode and decode codestreams and JP2 files that conform to the syntax defined in ITU-T Rec. T.800 | ISO/IEC 15444-1.

For transcoding to other image formats or for display, the three sets of reference software allow the user to assume in the absence of additional information that decoded codestream components are in the sRGB colour space or sRGB based greyscale.”

Page 7, Clause 9

Add a new [subclause 9.3](#) as follows:

9.3 OpenJPEG executables

The OpenJPEG reference software distribution provides three main executables:

- `opj_compress`: converts from a `pnm/pbm/pgm/ppm/pam/pgx/png/bmp/tif/raw/tga` file to a `j2k/jp2` file.
- `opj_decompress`: converts from a `j2k/jp2` file to a `pnm/pbm/pgm/ppm/pam/pgx/png/bmp/tif/raw/tga` file.
- `opj_dump`: dumps information about the `j2k/jp2` input file.

NOTE In addition to these three executables, other executables are available. These executables provide additional features related to other parts of the JPEG 2000 standard, but they are beyond the scope of this Recommendation.

Page 8, Clause 11

Replace:

“The reference software sources released with this Recommendation | International Standard are the latest tested versions available at the date on which the text was released for final approval. Later versions of the software and implementation or fault reports and fixes may be made available after the publication of this Recommendation | International Standard. These may be found at the URLs contained in the documentation for each version of the reference software, or through links which may be maintained at <http://www.jpeg.org/software>.”

by:

“The reference software sources released with this Recommendation | International Standard are the latest tested versions available at the date on which the text was released for final approval. Later versions of the software and implementation or fault reports and fixes may be made available after the publication of this Recommendation | International Standard. These may be found at the URLs contained in the documentation for each version of the reference software, or through links which may be maintained at <http://www.jpeg.org>.”

Page 13, [Annex C](#)

Add the following new [Annex C](#) after Annex B:

Annex C

OPENJPEG - C reference software - software description

(This annex forms an integral part of this Recommendation | International Standard)

C.1 Introduction

OpenJPEG is a software suite (libraries and application programs), written in C language, and dedicated to the implementation of JPEG standards. Among other parts, OpenJPEG provides the OpenJP2 library, an implementation of ITU-T Rec. T.800 | ISO/IEC 15444-1 (JPEG 2000 Part 1: Core coding system). OpenJPEG Software has been released under 2-Clauses BSD license. This software may be subject to other third party and contributor rights, including patent rights, and no such rights are granted under this license.

C.2 Getting and updating the software

The subset of the OpenJPEG software suite accompanying this Recommendation | International Standard is made of the *openjp2* library ([rev2916](#)), together with the *opj_compress*, *opj_decompress* and *opj_dump* executables. It represents the most recent version of this subset available at the time this Recommendation | International Standard was published. Subsequent versions, additional tools and functionalities, documentation, and test data are available as specified in Clause 11.

C.3 Building and using the software

The only maintained building method for the OpenJPEG software suite is through the use of CMake. This allows compiling OpenJPEG on a variety of different platforms without having to maintain several project files or makefiles.

Configuration of CMake files (through command-line, *ccmake* or *cmake-gui*) allows the user to decide which libraries and executables to build, and if required, third-party libraries (*libpng*, *libtiff*, *libz*, *liblcms2*) will be compiled or searched on the local machine. These third-party libraries are solely used by the executables to enable PNG and TIF support, and colour profile management. Once configuration is done, CMake generates makefiles or project files and the software can be built. The OpenJP2 library itself does not have any external dependencies (except the math library on Unix platform).

Once built, command-line executables can be used to convert images. Available parameters and options are described in the documentation and with the “-h” option of the executables.

C.4 Testing the software

The software accompanying this Recommendation | International Standard has been successfully tested against all conformance test files, following the procedures described in ITU-T Rec. T.803 | ISO/IEC 15444-4 (JPEG 2000 Part 4: Conformance testing). These tests are easily reproducible using the test data and procedures available as specified in Clause 11.