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Information technology — JPEG 2000 image coding system: Interactivity tools, APIs and protocols

Technologies de l'information — Système de codage d'image JPEG 2000: Outils d'interactivité, API et protocoles

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 15444-9 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information,* in collaboration with ITU-T. The identical text is published as ITU-T Rec. T.808.

ISO/IEC 15444 consists of the following parts, under the general title *Information technology — JPEG 2000 image coding system*:

— *Part 1: Core coding system*

— *Part 2: Extensions*

— *Part 3: Motion JPEG 2000*

— *Part 4: Conformance testing*

— *Part 5: Reference software*

— *Part 6: Compound image file format*

— *Part 8: Secure JPEG 2000*

— *Part 9: Interactivity tools, APIs and protocols*

— *Part 11: Wireless JPEG 2000*

— *Part 12: ISO base media file format*

The following parts are under preparation:

— *Part 10: Extensions for three-dimensional data and floating point data*

— *Part 13: An entry level JPEG 2000 encoder*

Introduction

ITU-T Rec. T.800 | ISO/IEC 15444-1 (JPEG 2000) is a specification that describes an image compression system that allows great flexibility, not only for the compression of images but also for access into the codestream. The codestream provides a number of mechanisms for locating and extracting portions of the compressed image data for the purpose of retransmission, storage, display, or editing. This access allows storage and retrieval of compressed image data appropriate for a given application without decoding.

The purpose of this Recommendation | International Standard is to provide a network protocol that allows for the interactive and progressive transmission of JPEG 2000 coded data and files from a server to a client. This protocol allows a client to request only the portions of an image (by region, quality or resolution level) that are applicable to the client's needs. The protocol also allows the client to access metadata or other content from the file.

Any organization contemplating the use of this Recommendation | International Standard should carefully consider its applicability.

The International Telecommunication Union (ITU), the International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this Recommendation | International Standard may involve the use of a patent.

The ITU, ISO and IEC take no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the ITU, ISO and IEC that he is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with the ITU, ISO and IEC. Information may be obtained from the companies listed in Annex M.

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INTERNATIONAL STANDARD
ITU-T RECOMMENDATION

Information technology – JPEG 2000 image coding system: Interactivity tools, APIs and protocols

1 Scope

This Recommendation | International Standard defines, in an extensible manner, syntaxes and methods for the remote interrogation and optional modification of JPEG 2000 codestreams and files in accordance with their definition in the following parts of ISO/IEC 15444:

- ITU-T Rec. T.800 | ISO/IEC 15444-1:2004 and its definition of a JPEG 2000 codestream and JP2 file format.
- the JPEG 2000 family of file formats as defined in further parts of ISO/IEC 15444.

In this Recommendation | International Standard, the defined syntaxes and methods are referred to as the JPEG 2000 Interactive Protocol, "JPIP", and interactive applications using JPIP are referred to as "JPIP systems."

JPIP specifies a protocol consisting of a structured series of interactions between a client and a server by means of which image file metadata, structure and partial or whole image codestreams may be exchanged in a communications efficient manner. This Recommendation | International Standard includes definitions of the semantics and values to be exchanged, and suggests how these may be passed using a variety of existing network transports.

With JPIP, the following tasks may be accomplished in varying, compatible ways:

- the exchange of capabilities;
- the negotiation of capabilities to use in a session;
- the request and transfer of the following elements from a variety of containers, such as JPEG 2000 family files, JPEG 2000 codestreams and other container files:
  - selective data segments;
  - selective and defined structures;
  - parts of an image or its related metadata.

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

- ITU-T Recommendation T.800 (2002) | ISO/IEC 15444-1:2004, *Information technology – JPEG 2000 image coding system: Core coding system.*
- ITU-T Recommendation T.801 (2002) | ISO/IEC 15444-2:2004, *Information technology – JPEG 2000 image coding system: Extensions.*
- ITU-T Recommendation T.802 (2005) | ISO/IEC 15444-3:2005, *Information technology – JPEG 2000 image coding system: Motion JPEG 2000.*
- ISO/IEC 15444-6:2003, *Information technology – JPEG 2000 image coding system – Part 6: Compound image file format.*
- IETF RFC 768 (1980), *User Datagram Protocol*. Available from World Wide Web: <http://www.ietf.org/rfc/rfc0768.txt>.

- IETF RFC 793 (1981), *Transmission Control Protocol*. Available from World Wide Web: <http://www.ietf.org/rfc/rfc0793.txt>.
- IETF RFC 2046 (1996), *Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types*. Available from World Wide Web: <http://www.ietf.org/rfc/rfc2046.txt>.
- IETF RFC 2234 (1997), *Augmented BNF for Syntax Specifications: ABNF*. Available from World Wide Web: <http://www.ietf.org/rfc/rfc2234.txt>.
- IETF RFC 2396 (1998), *Uniform Resource Identifiers (URI): Generic Syntax*. Available from World Wide Web: <http://www.ietf.org/rfc/rfc2396.txt>.
- IETF RFC 2616 (1999), *Hypertext Transfer Protocol – HTTP/1.1*. Available from World Wide Web: <http://www.ietf.org/rfc/rfc2616.txt>.