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Information technology — Multimedia framework (MPEG-21) —

Part 10:
Digital Item Processing

Technologies de l'information — Cadre multimédia (MPEG-21) —

Partie 10: Traitement d'élément numérique

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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 21000-10 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

ISO/IEC 21000 consists of the following parts, under the general title *Information technology — Multimedia framework (MPEG-21)*:

— *Part 1: Vision, Technologies and Strategy* [Technical Report]

— *Part 2: Digital Item Declaration*

— *Part 3: Digital Item Identification*

— *Part 4: Intellectual Property Management and Protection Components*

— *Part 5: Rights Expression Language*

— *Part 6: Rights Data Dictionary*

— *Part 7: Digital Item Adaptation*

— *Part 8: Reference Software*

— *Part 9: File Format*

— *Part 10: Digital Item Processing*

— *Part 11: Evaluation Tools for Persistent Association Technologies* [Technical Report]

— *Part 12: Test Bed for MPEG-21 Resource Delivery* [Technical Report]

— *Part 16: Binary Format*

The following parts are under preparation:

— *Part 14: Conformance Testing*

— *Part 15: Event Reporting*

— *Part 17: Fragment Identification of MPEG Resources*

— *Part 18: Digital Item Streaming*

Introduction

Today, many elements exist to build an infrastructure for the delivery and consumption of multimedia content. There is, however, no "big picture" to describe how these elements, either in existence or under development, relate to each other. The aim for ISO/IEC 21000 (MPEG-21) is to describe how these various elements fit together. Where gaps exist, MPEG-21 will recommend which new standards are required. ISO/IEC JTC 1/SC 29/WG 11 (MPEG) will then develop new standards as appropriate while other relevant standards may be developed by other bodies. These specifications will be integrated into the multimedia framework through collaboration between MPEG and these bodies.

The result is an open framework for multimedia delivery and consumption, with both the content creator and content consumer as focal points. This open framework provides content creators and service providers with equal opportunities in the MPEG-21 enabled open market. This will also be to the benefit of the content consumers, providing them access to a large variety of content in an interoperable manner.

The vision for MPEG-21 is to define a multimedia framework *to enable transparent and augmented use of multimedia resources across a wide range of networks and devices* used by different communities.

A key concept of the multimedia framework is the Digital Item. In MPEG-21 a Digital Item is a structured digital object with a standard representation, identification, and metadata. An equally important concept in the multimedia framework is the notion of the User. In MPEG-21 a User is any entity that interacts with the multimedia framework and as such includes all members of the value chain (e.g., creator, rights holders, distributors and consumers of Digital Items) and include, for example, individuals, consumers, communities, organizations, corporations, consortia, and governments.

Part 2 of MPEG-21 specifies the mechanism for declaring the structure and makeup of Digital Items. Such Digital Item Declarations are static by nature. This 10th part of MPEG-21 specifies tools enabling Users to provide suggested interactions with Digital Items, thereby enabling the inclusion of a dynamic aspect to the static declaration of Digital Items.

Information technology — Multimedia framework (MPEG-21) —

Part 10:
Digital Item Processing

1 Scope

This Part of ISO/IEC 21000, entitled Digital Item Processing (DIP), specifies the syntax and semantics of tools that may be used to process Digital Items. The tools provide a normative set of tools that specify the processing of a Digital Item in a predefined manner.

This technology is specified in one normative clause and three normative annexes:

— Digital Item Methods:

  Digital Item Methods (Clause 5) specifies the set of tools enabling Digital Item Users to include sequences of instructions for adding predefined functionality to a Digital Item. Such a sequence of instructions is a Digital Item Method. Digital Item Methods are authored with the Digital Item Method Language (see 5.2) which includes bindings to Digital Item Base Operations (see 5.4). For extended functionality, Digital Item eXtension Operations (see 5.6) allow such processing to be implemented more efficiently in a higher level programming language. Tools for integrating Digital Item Methods into Digital Item Declarations are also specified (see 5.3).

— ECMAScript bindings for Digital Item Base Operations:

  Annex A specifies the ECMAScript bindings for the Digital Item Base Operations described in 5.3.

— Java bindings for Digital Item Base Operations:

  Annex B specifies the Java bindings for the Digital Item Base Operations described in 5.4.

— Calling Java based DIXOs from Digital Item Methods:

  Annex C specifies the mechanism for calling Java based Digital Item eXtension Operations. Digital Item eXtension Operations are described in 5.6.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 16262:2002, *Information technology — ECMAScript language specification*

ISO/IEC 21000 (all parts), *Information technology — Multimedia framework (MPEG-21)*

IETF RFC 2046, *Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types*, 1996

IETF RFC 3986, *Uniform Resource Identifier (URI): Generic Syntax*, 2005

W3C REC-DOM-Level-3-Core-20040407, *Document Object Model (DOM) Level 3 Core Specification, Version 1.0*, W3C Recommendation 07 April 2004

W3C REC-DOM-Level-3-LS-20040407, *Document Object Model (DOM) Level 3 Load and Save Specification, Version 1.0*, W3C Recommendation 07 April 2004

W3C REC-xml-20040204, *Extensible Markup Language (XML) 1.0 (Third Edition)*, W3C Recommendation 04 February 2004

W3C REC-xml-names-19990114, *Namespaces in XML*, World Wide Web Consortium 14 January 1999

W3C REC-xmlschema-1-20041028, *XML Schema Part 1: Structures Second Edition*, W3C Recommendation 28 October 2004

W3C REC-xmlschema-2-20041028, *XML Schema Part 2: Datatypes Second Edition*, W3C Recommendation 28 October 2004

W3C REC-xpath-19991116, *XML Path Language (XPath), Version 1.0*, W3C Recommendation 16 November 1999