INTERNATIONAL STANDARD

ISO/IEC 23001-1

First edition
2006-04-01

AMENDMENT 1
2007-12-01

Information technology — MPEG systems technologies —

Part 1: Binary MPEG format for XML

AMENDMENT 1: Conformance and reference software

Technologies de l'information — Technologies des systèmes MPEG —

Partie 1: Format binaire de MPEG pour XML

AMENDEMENT 1: Conformité et logiciel de référence

Reference number
ISO/IEC 23001-1:2006/Amd.1:2007(E)

© ISO/IEC 2007

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2007

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

© ISO/IEC 2007 – All rights reserved

Not for Resale

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.

Amendment 1 to ISO/IEC 23001-1:2006 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 2007 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Information technology — MPEG systems technologies —

Part 1:
Binary MPEG format for XML

AMENDMENT 1: Conformance and reference software

Page 124

Add the following clauses after Clause 8:

9 Conformance

9.1 Encoder

The BiM Encoder consumes a textual XML document and produces a document in binary access unit form. Conformance testing of the BiM Encoder is not provided.

9.2 Bitstream in Access Unit Form

The binary bitstream in access unit form (together with its associated binary DecoderInit) is fed to the reference systems decoders. The decoded information is used to reconstruct a document after each access unit. Each resulting document is tested for validity against the schema declared in the associated DecoderInit.

The following conditions must be fulfilled as a necessary condition for each binary bitstream in access unit form:

1) The syntax of each binary access unit as well as the syntax of the binary DecoderInit must be correct wrt. the BiM syntax as defined in Clauses 6, 7 and 9 of ISO/IEC 23001-1.

2) Decoding the document fragment conveyed in the InitialDocument together with the document fragment conveyed in the first access unit must result in a document that is valid against the schema declared in the DecoderInit.

3) After each access unit the decoded document must be valid against the schema declared in the DecoderInit.

4) In any FUU, when the FU command is “add” then the FU context must not point to an instantiated node in the current document tree.

5) In any FUU, when the FU command is “update” or “delete” then the FU context must point to an instantiated node in the current document tree.

--`,,```,,,,````-`-`,,`,,`,`,,`---

© ISO/IEC 2007 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

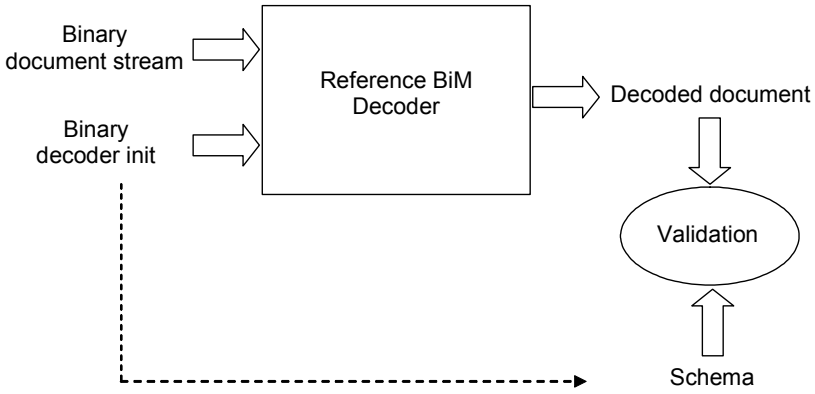


Figure 44 — Conformance testing of Bitstream in Access Unit Form

9.3 Decoder

9.3.1 Overview

The BiM Decoder consumes a document in binary access unit form and produces a textual XML document. Conformance testing of the Decoder involves checking whether the output of the Decoder is equivalent to that produced by a reference Decoder, as shown in Figure 45. The Test Decoder is said to be compliant if it produces a textual XML document output that is equivalent to that produced by a Reference Decoder.

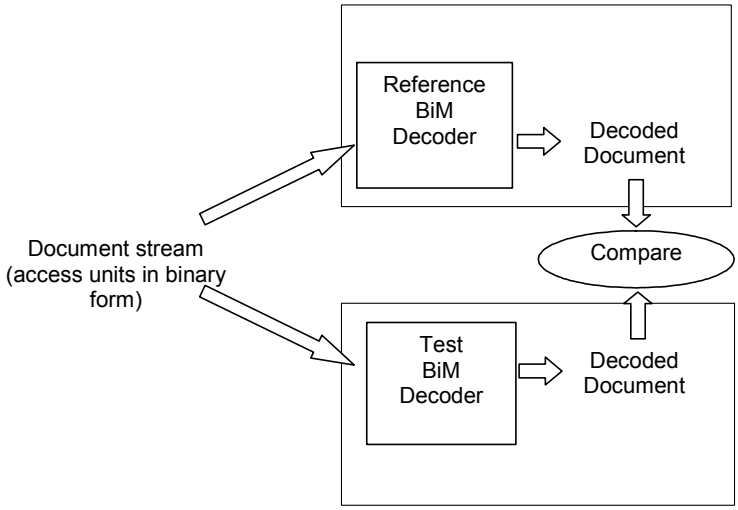


Figure 45 — Conformance testing of BiM Decoder

9.3.2 Definition of Reference Binary Access Unit Form Documents

The reference access unit documents are designed to test the following features:

— DecoderInit: Single and multiple SchemaReferences with and without locationHint

— DecoderInit with and without InitialDocument

— Access Units with single and multiple FUUs

© ISO/IEC 2007 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

— FU commands: addContent, updateContent, deleteContent, reset

— FU context: relative and absolute context path in combination with the FU commands above

— FU context: multiple payload mode

— FU context: addressing elements and attributes

— FU context: using “User Data Extension Code”

— FU context: use schemas including a variety of type definitions including SEQ, CHOICE, ALL content models (also in hierarchical definitions of SEQ and CHOICE) as well as simple content in a complex type

— FU context: using type codes as well as substitution codes

— FU context: using MPCs, no PC, SPCs as well as implicit asignment of MPCs and SPCs

— FU payload: with and without use of “unit size” (declared in DecoderInit)

— FU payload: with and without deferred nodes

— FU payload: use the different length coding modes

— FU payload: with and without specific type codecs

— FU payload: using type codes as well as substitution codes

— FU payload: use schemas including a variety of type definitions including SEQ, CHOICE, ALL content models (also in hierarchical definitions of SEQ and CHOICE) as well as simple content in a complex type

10 Reference software

10.1 Reference software components

The reference software related to ISO/IEC 23001-1 is known as experimentation software (XM).

Table 13 shows the reference software components.

Table 13 — Reference software components

Name of the Tool in this specification	Name of the Tool in the XM software
Bit Stream Encoder/Decoder	SystemTools/BiM

10.2 Introduction

The BiM reference software is the set of sources, libraries, examples and documentation related to the encoding, decoding and handling of the binary XML format defined by ISO/IEC 23001-1. The package contains different tools, and an intuitive GUI application to control the binarization process of a generic XML source.

-`,,```,,,,````-`-`,,`,,`,`,,`---
© ISO/IEC 2007 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

10.2.1 Package content

The BiM reference software contains:

- The implementation sources for the encoding / decoding algorithms
- The set of the external libraries for building and running the programs: xerces.jar, xerces-c_1_X.so/.dll (version 1.6 is known to compile successfully), and gnu-regexp-1.1.3.jar
- A set of command line tools and GUI applications to apply the binarization on different sources
- A set of example files:
  - MPEG-7 XML Schemas and a set of MPEG-7 files
  - MPEG-21 XML Schemas and a set of MPEG-21 files
  - A set of other XML files and associated XML Schemas for the binarization of generic files
- A.so/.dll and its sources (SIEMENS) containing the functions necessary to encode a textual path in a binary path and to decode a binary path from the bit stream into a textual path
- A short documentation

10.2.2 Installation and execution

Prerequisites: the Java Sun JDK (version 1.4) is needed to use the BiM reference software. The software can be unzipped anywhere in the target machine. Some libraries (xerces-c_1_4.dll, navigation_path.dll, included) need to be installed on the machine in order to complete the installation. Refer to the readme.txt file for the detailed instruction for your platform.

The execution of the encoding, decoding and GUI tools is controlled by scripts included in the distribution.

10.3 Software overview

The reference software functionality can be grouped as follows:

- XML-Schema parsing and validation

The BiM compression algorithm is based on the knowledge of the schema underlying the XML stream. A central part of the reference software is then dedicated to the parsing and validation of XML Schema, and to the building of the objects and automatas used during the encoding / decoding.

The com.expway.schema hierarchy contains the main classes for the validation and internal structure building. Among them, com.expway.schema.GeneralSchemaHandler contains the main entry points for the schema handling.

- Encoding

The encoding process uses the information built during the schema parsing to scan the input file and to encode the structure of the document and its leaves. The main class for the encoding process is **"com.expway.binarisation.GeneralBinaryHandler"**: it behaves like a SAX ContentHandler, and all the binarization is driven by the input XML.

In the encoding process, simple XML-Schema types (xsd:string, xsd:enumeration) have built-in encoding rules, but dedicated encoders can also be associated to particular XML-Schema types to get a fine-grain control over the compression performances of a known XML-Schema. The structure of the document is encoded as in the current specification.

© ISO/IEC 2007 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

The "com.expway.gui" package contains an entry point to a GUI interface: BiMGUI, and the "com.expway. binarisation.GeneralBinaryHandler" package contains an entry point to a command line encoder.

- Decoding

The decoding process is somewhat simpler because it does not need to parse the XML-Schema that had been used for the encoding. The decoding uses the decoderConfig information produced in the schema parsing phase.

*The decoder's entry points are in "**com.expway.binarisation.GeneralDecompression**".*

10.3.1 Main packages

As explained before, the **com.expway.schema** contains the main algorithms for the schema static analysis and structure building.

The encoding phase is handled by the automata-based algorithm implemented mainly in the **com.expway.automata** and **com.expway.binarisation** packages.

The **com.expway.expression** package contains the encoding infrastructure for XML-Schema related types.

*As stated before, the **com.expway.gui, com.expway.binarisation.GeneralBinaryHandler**, and **com.expway.binarisation.GeneralDecompression** packages contain the entry points for the GUI and command line tools.*

Page 132

Add the following new annex after Annex C:

© ISO/IEC 2007 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Annex D
(normative)

Reference Bitstreams Description

Table D.1 — Conformance Stream description

Conformance Stream	Decoder Init			Fragment Updates	Context Path		Commands				Payload
	Descr	Multiple Fragments	Schema References	Fragment Updates	Type	Address	Add	Delete	Replace	Reset	Deferred Nodes
singleAU/			✓	Single	Absolute	root	✓				
multipleAUs/000			✓	Multiple	Absolute	elements	✓		✓		
multipleAUs/019	✓		✓	Single	Absolute	elements			✓		
multipleAUs/036			✓	Single	Absolute	elements	✓	✓			
multipleAUs/094			✓	Multiple	Absolute	elements	✓				
multipleAUs/094-2			✓	Multiple	Absolute	elements	✓			✓	
multipleAUs/102			✓	Multiple	Absolute	elements	✓				
multipleAUs/102-2			✓	Multiple	Absolute	elements	✓			✓	
multipleAUs/153			✓	Single	Absolute	elements	✓	✓			

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale
© ISO/IEC 2007 – All rights reserved

Conformance Stream	Decoder Init			Fragment Updates	Context Path		Commands				Payload
	Descr	Multiple Fragments	Schema References	Fragment Updates	Type	Address	Add	Delete	Replace	Reset	Deferred Nodes
AbsoluteContextPath_MixedContent/				Single	Absolute	mixed text	✓				
RelativeContextPath_MixedContent/				Single	relative	mixed text	✓				
MDS_Zlib/				Single	Absolute	root	✓				
MDS_DeferredFragmentReference/				Single	Absolute	fragment reference	✓				
MDS_NonDeferredFragmentReference/				Single	Absolute	fragment reference	✓				

© ISO/IEC 2007 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

ICS 35.040

Price based on 7 pages

© ISO/IEC 2007 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale