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Information technology — Object Management Group XML Metadata Interchange (XMI)

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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 19509 was prepared by the Object Management Group (OMG) and was adopted, under the PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

ISO/IEC 19509 is related to:

- ISO/IEC 19505-2:2011, Information technology - Object Management Group - Unified Modeling Language (OMG UML) - Part 2: Superstructure
- ISO/IEC 19508: 2014, Information technology - Object Management Group - Meta Object Facility (MOF) Core

ISO/IEC 19509, under the general title *Information technology - Open distributed processing - MOF 2 XMI Mapping specification (XMI)*, apart from this introductory material is identical with that for the OMG specification for MOF 2 XMI Mapping, version 2.4.2.

Introduction

The main purpose of XMI is to enable easy interchange of metadata between application development lifecycle tools (such as modeling tools based on the Unified Modeling Language (UML), ISO/IEC 19505, and metadata repositories/ frameworks based on the Meta Object Facility (MOF), ISO/IEC 19508) in distributed heterogeneous environments. XMI integrates three key industry standards:

- XML - eXtensible Markup Language, a W3C standard
- UML - Unified Modeling Language (ISO/IEC 19505)
- MOF - Meta Object Facility (ISO/IEC 19508)

This International Standard does *not* deprecate or replace ISO/IEC 19503:2005, Information technology - XML Metadata Interchange (XMI). The specification provided by this International Standard is identical to the OMG specification XMI 2.4.2 that is aligned with MOF 2.4.1 (ISO/IEC 19508) and UML 2.4.1 (ISO/IEC 19505). It is not backward compatible with XMI 1.4, as specified in ISO/IEC 19503:2005, which is aligned with MOF 1.4, as specified in ISO/IEC 19502:2005, and UML 1.4.2, as specified in ISO/IEC 19501:2005.

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1 Scope

This International Standard supports the Meta Object Facility (MOF) Core defined in ISO/IEC 19508. MOF is the foundation technology for describing metamodels. It covers a wide range of domains, and is based on a constrained subset of UML. XMI is widely used XML interchange format. It defines the following aspects involved in describing objects in XML:

- The representation of objects in terms of XML elements and attributes.
- The standard mechanisms to link objects within the same file or across files.
- The validation of XMI documents using XML Schemas.
- Object identity, which allows objects to be referenced from other objects in terms of IDs and UUIDs.

XMI describes solutions to the above issues by specifying EBNF production rules to create XML documents and Schemas that share objects consistently.

2 Conformance

2.1 General

This sub clause describes the required and optional points of compliance with the XMI specification. The terms “XMI Document” and “XMI Schema” are defined in Clause 4.

2.2 Required Compliance

2.2.1 XMI Schema Compliance

XMI Schemas must be equivalent to those generated by the XMI Schema production rules specified in this document. Equivalence means that XMI documents that are valid under a schema produced by the XMI Schema production rules would be valid in a conforming XMI Schema and that those XMI documents that are not valid under a schema produced by the XMI Schema production rules are not valid in a conforming XMI Schema.

2.2.2 XMI Document Compliance

XMI Documents are required to conform to the following points:

- The XMI document must be “valid” and “well formed” as defined by the XML recommendation, whether used with or without the document’s corresponding XMI Schema(s). Although it is optional not to transmit and/or validate a document with its XMI Schema(s), the document must still conform as if the check had been made.
- The XMI document must be equivalent to those generated by the XMI Document production rules specified in this document. Equivalence for two documents requires a one to one correspondence between the elements in each document, each correspondence identical in terms of element name, element attributes (name and value), and contained elements. Elements declared within the XMI documentation and extension elements are excepted.

2.2.3 Software Compliance

Software is XMI schema compliant when it produces XML schemas that are XMI schema compliant. Software is XMI document compliant when it produces or consumes XML documents that are XMI document compliant.

2.3 Optional Compliance Points

2.3.1 XMI Extension and Differences Compliance

XMI Documents optionally conform to the following points:

- The guidelines for using the extension elements suggested in “XMI Model” on page 8 are found there and in “Tailoring Schema Production” on page 27.’ Tools should place their extended information within elements that are not in the XMI namespace or within elements that have the XMI namespace and a tag name of “Extension.” They should also declare the nature of the extension using the standard XMI elements where applicable, and preserve the extensions of other tools that fall within the XMI namespace.
- Processing of XMI differencing elements (in sub clause 7.11.5, ’Effects on Document Production) is an optional compliance point.

3 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.

- [MOF] “ISO/IEC 19508:2014 Information technology - Object Management Group - Meta Object Facility Core.” (OMG Specification Meta Object Facility (MOF) Core Specification, Version 2.4.2 - http://www.omg.org/spec/MOF/2.4.2)
- [UMLInfra] “ISO/IEC 19505-1:2012 Information technology - Object Management Group - Unified Modeling Language (OMF UML) - Part 1: Infrastructure.” (OMG Specification Unified Modeling Language (OMG UML) Version 2.4.1 - Part 1: Infrastructure - http://www.omg.org/spec/UML/2.4.1/Infrastructure)
- [UMLSuper] “ISO/IEC 19505-2:2012 Information technology - Object Management Group - Unified Modeling Language (OMF UML) - Part 2: Superstructure.” (OMG Specification Unified Modeling Language (OMG UML) Version 2.4.1 - Part 2: Superstructure - http://www.omg.org/spec/UML/2.4.1/Superstructure)
- [XML] “Extensible Markup Language (XML) 1.0 (Fifth Edition) W3C Recommendation 26 November 2008 http://www.w3.org/TR/2008/REC-xml-20081126/

- [XMLSchema] “XML Schema Part 1: Structures Second Edition” W3C Recommendation 28 October 2004 http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/
- [XMLSchema2] “XML Schema Part 2: Datatypes Second Edition” W3C Recommendation 28 October 2004 http://www.w3.org/TR/2004/REC-xmlschema-2-20041028/
- [XLink] “XML Linking Language (XLink) Version 1.1” W3C Recommendation 26 May2010 http://www.w3.org/TR/2010/REC-xlink11-20100506/
- [XPointerFramework] “XPointer Framework” W3C Recommendation 25 March 2003 http://www.w3.org/TR/2003/REC-xptr-framework-20030325/
- [XPointerElement] “XPointer element() Scheme” W3C Recommendation 25 March 2003 http://www.w3.org/TR/2003/REC-xptr-element-20030325/
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- [NAMESP] “Namespaces in XML 1.0 (Third Edition)” W3C Recommendation 8 December 2009 http://www.w3.org/TR/2009/REC-xml-names-20091208/
- [INFOSET] “XML Information Set (Second Edition)” W3C Recommendation 4 February 2004 http://www.w3.org/TR/2004/REC-xml-infoset-20040204/