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Information technology — Learning, education, and training — Content packaging —

Part 2: XML binding

Technologies de l'information — Apprentissage, éducation et formation — Paquetage du contenu —

Partie 2: Liaison XML

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Foreword

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ISO/IEC 12785-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 36, *Information technology for learning, education and training*.

ISO/IEC 12785 consists of the following parts, under the general title *Information technology — Learning, education, and training — Content packaging*:

— *Part 1: Information model*

— *Part 2: XML binding*

— *Part 3: Best practice and implementation guide*

Introduction

This part of ISO/IEC 12785 will be used as the basis for the production of the following documents:

- ISO/IEC 12785-3 (*Best practice and implementation guide*);
- Content Packaging XML XSD.[1)]

This part of ISO/IEC 12785 details how the ISO/IEC 12785-1 information model should be represented using XML schema. The content packaging binding is contained in two XML schemas and two vocabulary files. The vocabulary files are instances of the IMS Vocabulary Definition Exchange specification. ISO/IEC 12785-3 provides non-normative guidance on how to use the binding and information model. For a conceptual overview of ISO/IEC 12785, see ISO/IEC 12785-1. For a discussion of potential applications, see ISO/IEC 12785-3. Conformance to ISO/IEC 12785 is addressed within ISO/IEC 12785-1.

1) This XML schema definition can be accessed from: http://www.imsglobal.org/content/packaging/index.html.

Information technology — Learning, education, and training — Content packaging —

Part 2: XML binding

1 Scope

This part of ISO/IEC 12785 specifies how to represent the ISO/IEC 12785-1 information model in XML, and details each element binding of the content packaging XML schema.

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 12785-1:2009, *Information technology — Learning, education, and training — Content packaging — Part 1: Information model*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
binding
XML data binding
means of representing the information in an XML document

NOTE See XML data binding of Wikipedia: http://en.wikipedia.org/wiki/XML_data_binding (retrieved November 18, 2009).

3.2
control file
single computer file that governs the binding of the Content Packaging Information Model to make it suitable for machine processing

NOTE A software component can refer to a control file when assessing the validity of a bound instance of the information model or to guide the creation of a bound instance of the information model.

EXAMPLE A file containing an XML schema can be used as a control file for an XML binding of a manifest.

3.3
content
individual file or multiple files usable in learning, education and training

NOTE 1 A logical unit of usable (and reusable) information can be described by a logical package.

NOTE 2 logical package can contain one or more units of content.

3.4
logical package
representation of one or more units of usable (and reusable) content

NOTE A logical package encompasses the full set of components described by the manifest and its child manifests, including the local components and the remote components included by reference.

[ISO/IEC 12785-1:2009]

3.5
namespace
XML namespace identified by a URI reference

NOTE Namespace in Content Packaging follows W3C recommendation *Namespaces in XML 1.0 (Second Edition)*.

[ISO/IEC 12785-1:2009]

3.6
manifest
description of files and any logical relationships between them, contained or referenced in a content package

3.7
metadata
⟨content packaging⟩ descriptive information about logical packages, logical organizations, content and files

NOTE 1 Metadata can be assigned to any of the core structures within the logical package, including the manifest.

NOTE 2 Any binding of a metadata object is permitted. Each object of metadata can be local or remote.

[ISO/IEC 12785-1:2009]

3.8
organization
logical relationships, such as a hierarchical tree, among unit of content

NOTE More than one logical organization can be described in a manifest.

3.9
package
unit of usable (and reusable) content

NOTE 1 This can be part of a learning course that has instructional relevance outside of a content aggregation and can be delivered independently, as an entire learning course or as a collection of learning courses.

NOTE 2 A package is able to stand-alone; that is, it contains all the information needed to use the contents for learning, education, and training when it has been unpacked.

3.10
resource
⟨content packaging⟩ one URL entry point and zero or more references to files that are required before the content is launched

NOTE The files described by a resource can be local or remote.

3.11
schema
XML Schema
description of a class of XML documents, expressed in terms of constraints on the structure and content of those documents

NOTE 1 For more information see http://www.w3c.org/XML/Schema.

NOTE 2 XML Schema in Content Packaging follows W3C recommendation *XML Schema*.

NOTE 3 The definition refers to the concept of a schema in an XML context, as well as a specific language for creating such schemas: the W3C XML Schema. The "IMS Content Packaging XML XSD" is an application of the W3C XML Schema language.

3.12
unit of content
file or grouping of files which can be represented within a manifest

3.13
XML validation
process whereby documents written in XML (eXtensible Markup Language) are verified against the defined structure

NOTE Strict validation in XML means that it must follow the rules dictated by an XML schema.

4 Abbreviated terms

CPIM	Content Packaging Information Model
I-BAT	IMS Binding Auto-generation Tool-kit
LET	Learning, Education, and Training
MDA	Model Driven Architecture
PIM	Protocol Independent Model
PSM	Platform Specific Model
UML	Unified Modeling Language
VDEX	Vocabulary Definition Exchange
W3C	World Wide Web Consortium
XMI	XML Metadata Interchange
XML	eXtensible Mark-up Language (W3C XML)
XSD	XML Schema Definition
XSL	Extensible Stylesheet Language
XSLT	XSL Transformations

5 XML schema documentation

5.1 Core content packaging binding description

5.1.1 Schema document properties

The following subclauses outline the characteristics of each element of the content packaging XML schema binding for core[2)] elements in tabular form. The same information is also presented as an XSD in Annex B.1.

In accordance with the IMS Global Learning Consortium (GLC) Namespace Policy [IMS-NAMESPACE] specified in IMS Content Packaging XML Binding, the “name” of an element is appended to a IMS GLC namespace URI to construct a Uniform Resource Identifier as a globally unique identifier for that element. The use of element names and URIs in the context of different implementation technologies is explained in ISO/IEC 12785-2.

To describe XML instance representation of each element declared namespaces are as follows:

Prefix	Namespaces
Default namespace	http://www.imsglobal.org/xsd/imscp_v1p1
xml	http://www.w3.org/XML/1998/namespace
xs	http://www.w3.org/2001/XMLSchema
xsi	http://www.w3.org/2001/XMLSchema-instance

Schema component representation:

```
<xs:schema targetNamespace="http://www.imsglobal.org/xsd/imscp_v1p2" version="IMS CP 1.2"
elementFormDefault="qualified" attributeFormDefault="unqualified">
<xs:import namespace="http://www.w3.org/XML/1998/namespace"
schemaLocation="http://www.w3.org/2001/xml.xsd"/>

...
</xs:schema>
```

The following subclauses was created using the schema documentation tool provided as part of the Oxygen product. To describe logical diagram used notations are as follows:

- @ : xs:attribute
-  : xs:sequence
-  : xs:anyAttribute
-  : xs:any namespace

2) The core refers to all those elements that were used in the IMS Content Packaging specification versions prior to version 1.2 which is source of ISO/IEC 12785.

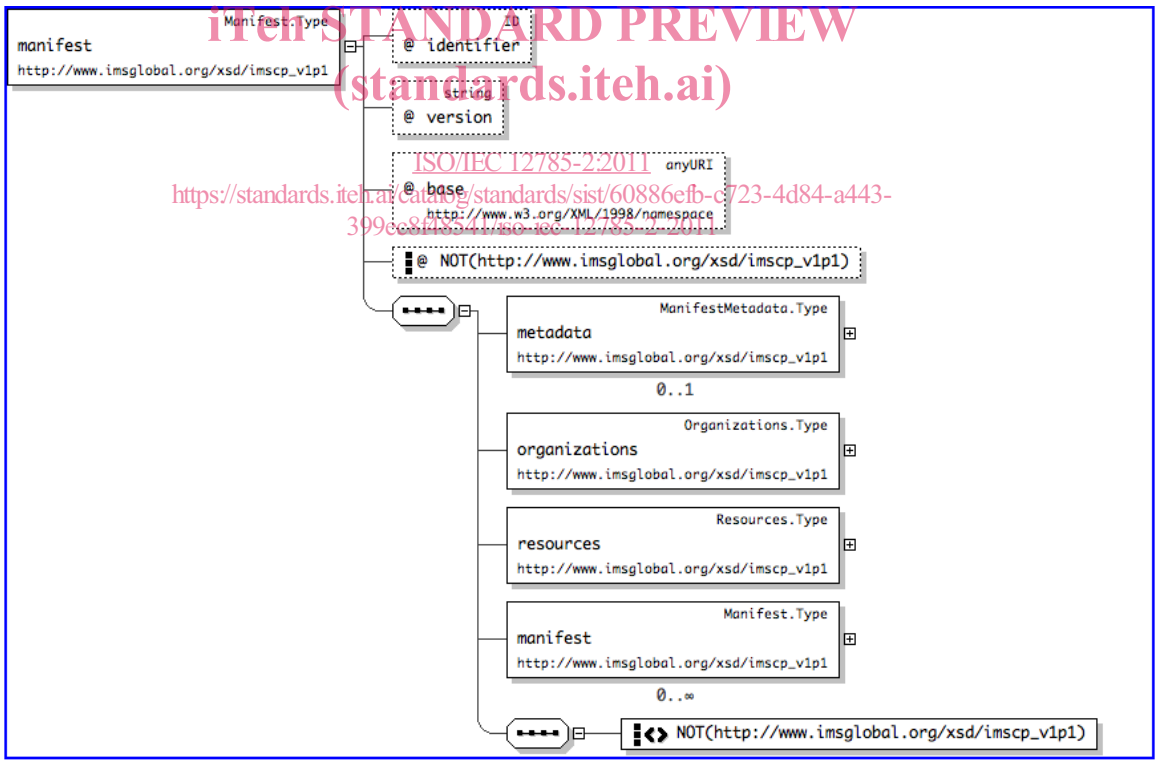
- ▪▪ : xs:group
- 0..1 : property for zero to one
- 0..∞ : property for zero to unbounded
- ☐ : xs:complexType

5.1.2 Global declarations

5.1.2.1 Element: manifest

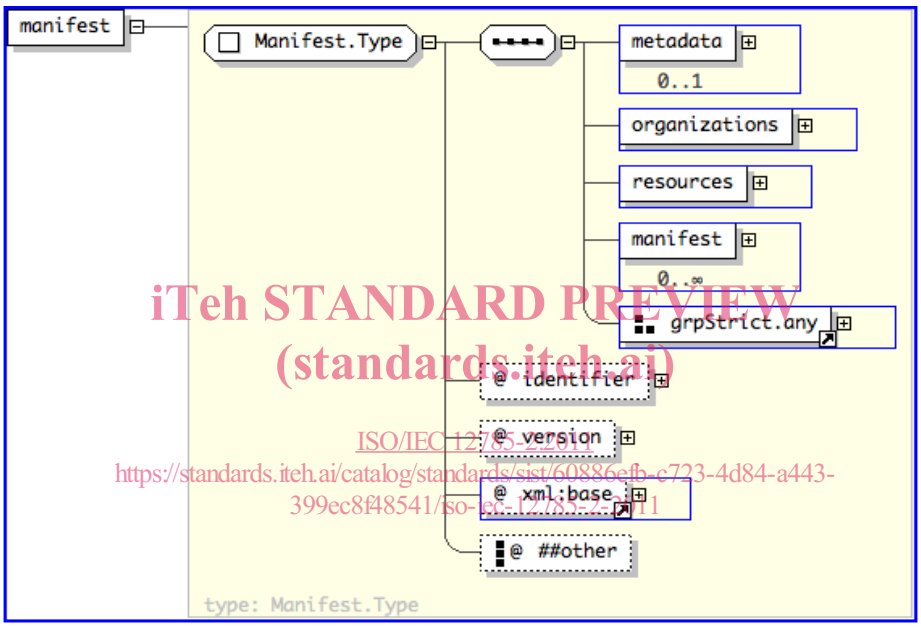
Name	manifest
Type	Manifest.Type
Nillable	no
Abstract	no

Logical diagram of manifest:



XML instance representation:
<manifest
identifier=" xs:ID [1]"
version=" xs:string [0..1]"
xml:base="[0..1]"
Allow any attributes from a namespace other than this schema's namespace (strict validation).
>
<metadata> ManifestMetadata.Type </metadata> [0..1]
<organizations> Organizations.Type </organizations> [1]
<resources> Resources.Type </resources> [1]
<manifest> Manifest.Type </manifest> [0..*]
Allow any elements from a namespace other than this schema's namespace (strict validation). [0..*]
</manifest>

Diagram:



Schema component representation:
<xs:element name="manifest" type=" Manifest.Type "/>

5.1.3 Global definitions

5.1.3.1 Complex Type: Dependency.Type

Super-types:	None
Sub-types:	None

Name	Dependency.Type
Used by (from the same schema document)	Complex Type Resource.Type
Abstract	no