INTERNATIONAL STANDARD

ISO/IEC 23000-7

Information technology — Multimedia application format (MPEG-A) —

Part 7:
Open access application format

Technologies de l'information — Format pour application multimédia (MPEG-A) —

Partie 7: Format pour application d'accès ouvert

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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 23000-7 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 23000 consists of the following parts, under the general title *Information technology — Multimedia application format (MPEG-A)*:

— *Part 1: Purpose for multimedia application formats* [Technical Report]

— *Part 2: MPEG music player application format*

— *Part 3: MPEG photo player application format*

— *Part 4: Musical slide show application format*

— *Part 5: Media streaming application format*

— *Part 7: Open access application format*

— *Part 8: Portable video application format*

— *Part 9: Digital multimedia broadcasting application format*

— *Part 10: Video surveillance application format*

Introduction

The open access application format is a format to ease the exchange and promotion of open contents. It is designed for the cases where users own rights to a piece of content and have an interest in releasing it in such a way that other users can freely access it. However, the users do not want to make the content public domain. Users want to release a piece of content that is governed in a "light-weight" form. This type of release is called "open access" and the set of technologies that support it is called open access application format.

Examples of open access contents are publicity material and teasers. One important set of major potential applications is represented by the BBC's Creative Archive project. Another important application is in the scientific area, where publications, research results or e-learning material are published.

Open access is an application format (AF) and is specified as Part 7 of MPEG-A (ISO/IEC 23000-7). The open access AF defines a packaging format that can contain any type of content. Additionally, the AF contains a license for each content, which describes how the content may be used. These licenses are created by the authors of the content, who want to publish their content, but still want to retain some specific rights. The license is in a machine-readable format and helps the consumer to understand, what he is allowed to do with the content. Furthermore it enables the usage of automatic processing and interpretation of these licenses.

The open access AF is a standardized and interoperable solution for the release and exchange of contents. It enables the author of a content to package his creation into a single container and publish it together with a predefined license. It is designed to emphasize the exchange of contents and the re-usage or derivation of the contents by other users.

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Information technology — Multimedia application format (MPEG-A) —

Part 7:
Open access application format

1 Scope

This International Standard specifies a container format, which can contain any type of content and can also transport additional metadata. This packaging mechanism offers the possibility to enrich the content with human and machine-readable metadata and is not limited to a specific content type. Unlike other application formats, the open access application format is not a multimedia-based format.

The open access application format doesn't use encryption mechanisms to protect the access of the content. However the content can be protected by digital signatures, which allow the verification of the integrity, authenticity and non-repudiation of the content.

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 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

ISO 3166-2, *Codes for the representation of names of countries and their subdivisions — Part 2: Country subdivision code*

ISO/IEC 15938-5, *Information technology — Multimedia content description interface — Part 5: Multimedia description schemes*

ISO/IEC 21000-2, *Information technology — Multimedia framework (MPEG-21) — Part 2: Digital Item Declaration*

ISO/IEC 21000-3, *Information technology — Multimedia framework (MPEG-21) — Part 3: Digital Item Identification*

ISO/IEC 21000-5, *Information technology — Multimedia framework (MPEG-21) — Part 5: Rights Expression Language*

ISO/IEC 21000-9, *Information technology — Multimedia framework (MPEG-21) — Part 9: File Format*

ISO/IEC 21000-15, *Information technology — Multimedia framework (MPEG-21) — Part 15: Event Reporting*

3   Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

DI   Digital Item

DID   Digital Item Declaration

DIDL   Digital Item Declaration Language

DII   Digital Item Identification

ER   Event Report

ER-R   Event Report Request

RDD   Rights Data Dictionary

REL   MPEG-21 Rights Expression Language

AF   Application Format

OA   Open Access

OAC   Open Access Content

URI   Uniform Resource Identifier [1]

URL   Uniform Resource Locator [1]

XML   Extensible Markup Language [2]

4   Namespace conventions

Qualified names are written throughout this part of ISO/IEC 23000 consistently with a namespace prefix followed by a colon followed by the local part of the qualified name. Table 1 contains these prefixes and the corresponding namespace. If not declared otherwise, the default namespace in this document is defined as `urn:mpeg:mpeg21:2002:02-DIDL-NS` and the different prefixes are bound to the namespaces as listed in the table.

Table 1 — Prefixes to Namespaces

Prefix	Namespace
didl	urn:mpeg:mpeg21:2002:02-DIDL-NS
dii	urn:mpeg:mpeg21:2002:01-DII-NS
er	urn:mpeg:mpeg21:2007:01-ERL-OA-NS
m3x	urn:mpeg:mpeg21:2006:01-REL-M3X-NS
m1x	urn:mpeg:mpeg21:2005:01-REL-M1X-NS
mx	urn:mpeg:mpeg21:2003:01-REL-MX-NS
r	urn:mpeg:mpeg21:2003:01-REL-R-NS
sx	urn:mpeg:mpeg21:2003:01-REL-SX-NS
mpeg7	urn:mpeg:mpeg7:schema:2004
xsd	http://www.w3.org/2001/XMLSchema
xsi	http://www.w3.org/2001/XMLSchema-instance
NOTE The prefixes xml and xmlns are normatively defined by *Namespaces in XML (see W3C REC-xml-names-19990114)*. All other prefixes are informative and are used by convention for consistency in this part of ISO/IEC 23000.	

5   System overview

The Open Access Application Format provides mechanisms for the content consumer as well as the content authors. The author uses the format to release his content with attached Meta-information about his content and the corresponding license. The license can be embedded as a text, which can be presented, when the consumer wants to open, copy or adapt the content. Furthermore, the format helps the author to notify the consumer about the intended way of using the content. These intentions can be expressed with the MPEG-21 REL OAC profile, which consists of several rights and conditions that can be selected by the author. The consumer of the content can be either a particular person or the public. The author can choose which specific rights he wants to grant under certain conditions.

Additionally the author can apply MPEG-21 Event Reports, which can be used as a feedback mechanism. Every time a consumer e.g. opens a released content, the author receives a report, which tells him, that his content was extracted. A similar event can be generated, when a consumer wants to derive a content. Then, the author of the content receives a notification that another user intends to reuse his content. When the author finally releases the file, unique identifiers are assigned to the contents, so that they can be uniquely identified.

The consumer uses the provided meta-information to ease the management of the available contents. As the information is machine-readable, it enables the consumer e.g. to find contents that match given criteria.

6   Technical Specification

6.1   Introduction

The following subclauses list and reference MPEG technologies and describe their purpose for this part of ISO/IEC 23000.

6.2   Digital Item Declaration

This part of ISO/IEC 23000 utilises ISO/IEC 21000-2 to associate content with a set of related information. For the identification of the contents ISO/IEC 21000-3 is used. The following structures are needed from ISO/IEC 21000-2:

- DIDL

- Container

- Item

- Descriptor

- Statement

- Resource

- Component

- Annotation

Annex A gives a full example about the usage of ISO/IEC 21000-2 in Open Access. The following subclauses describe the syntax and semantic of each element of ISO/IEC 2100-2.

6.2.1 DIDL

6.2.1.1 Syntax
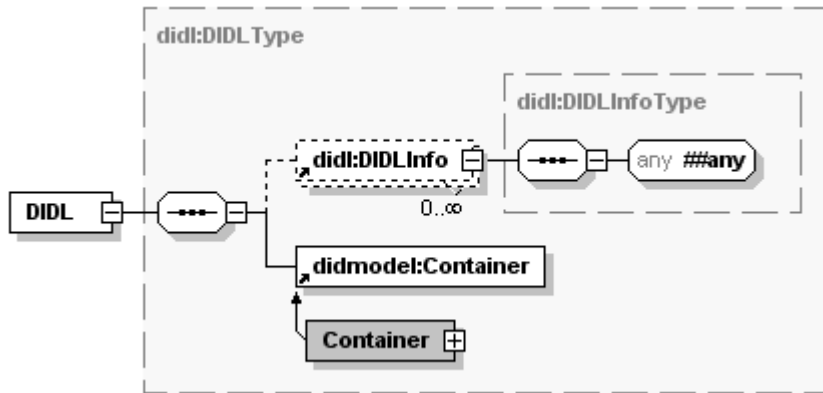
6.2.1.2 Semantic

The DIDL-Element is the root of the xml description and contains a DIDLInfo element and a Container element.
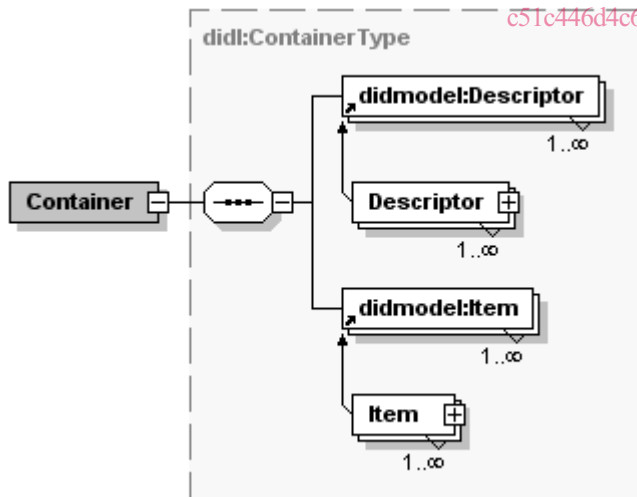
The DIDLInfo element allows specifying information about the DIDL document itself. In Open Access this element is used to embed a digital signature for the whole DIDL document. Other DIDLInfo elements can be ignored. The structure of the digital signature is described in 6.6.

6.2.2 Container

6.2.2.1 Syntax

6.2.2.2 Semantic

The Container element is a grouping of Items bound with a set of Descriptors that contain descriptive information about the Container. It may have any attribute from other namespaces that provide an additional representation of a Descriptor. As descriptive information an identifier according to ISO/IEC 21000-3 and metadata as defined in ISO/IEC 15938-5 must be supported.

The identifier declares a unique URI for every container that allows identifying the whole container as a creation from a specific author. Every container must have exactly one identifier. Subclause 6.3 explains the usage of ISO/IEC 21000-3 more detailed.

The metadata described with ISO/IEC 15938-5 is used to provide information about the author of the container, i.e. the whole package. Every container can have one Descriptor, which contains one or more CreatorType elements. The CreatorType with the corresponding attributes is specified in 6.4.2.

6.2.2.3 Example

The following example shows the usage of the DIDL, Container and Item element.

```
<?xml version="1.0" encoding="UTF-8"?>
<DIDL>
  <Container>
    <Descriptor>
      <Statement mimeType="text/xml">
        <dii:Identifier>...</dii:Identifier>
      </Statement>
    </Descriptor>
    <Descriptor>
      <Statement mimeType="text/xml">
        <mpeg7:Creator>...</mpeg7:Creator>
      </Statement>
    </Descriptor>
    <Item> ... </Item>
    <Item> ... </Item>
    ...
  </Container>
</DIDL>
```
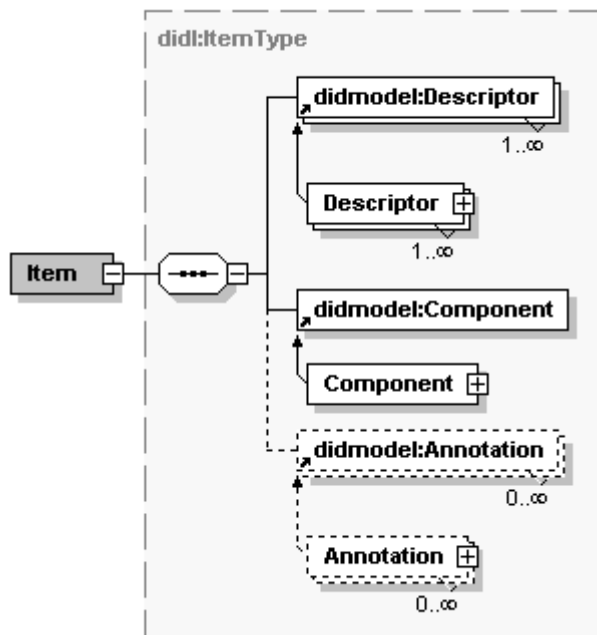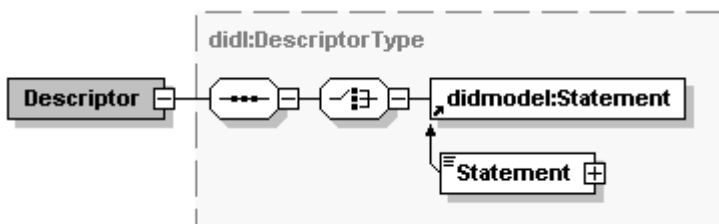
6.2.3 Item

6.2.3.1 Syntax

6.2.3.2 Semantic

The Item element contains the Components and a set of relevant Descriptors and Annotations. The Descriptors provide descriptive information about the Item. A Descriptor containing a plain text description with the mime type "text/plain" must be supported. This Descriptor can be used to provide a descriptive text about the item. Every item can also have one or more attached ERR (Event Report Request) from ISO/IEC 21000-15 in Descriptor elements, which have to be supported. Further details about ERR are explained in 6.6.

An Item may have any attribute from other namespaces. Such attributes provide an additional representation of a Descriptor and contain descriptive information about the Item by means of an attribute.

6.2.3.3 Example

The following example shows the usage of the Item, Descriptors, Components and Annotation elements.

```
<Item>
  <Descriptor>
    <Statement mimeType="text/plain">...</Statement>
  </Descriptor>
  <Descriptor>
    <Statement mimeType="text/xml">
      <er:ERR>...</er:ERR>
    </Statement>
  </Descriptor>
  <Component>...</Component>
  <Annotation>...   </Annotation>
</Item>
```

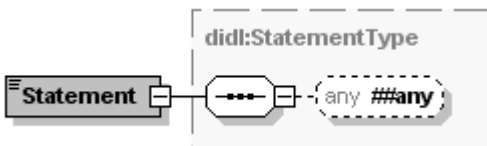### 6.2.4 Descriptor

6.2.4.1 Syntax

6.2.4.2 Semantic

The Descriptor element is used to associate descriptive data with a parent element. A Descriptor may have any attribute from other namespaces. The Descriptor only may take the form of a Statement.

### 6.2.5 Statement

6.2.5.1 Syntax

6.2.5.2 Semantic

The Statement element represents a textual value that contains information, but not an Asset. In general a Statement may contain any data format, including plain text and various machine-readable formats, such as well-formed XML. The data type of the Statement is identified by the MIMETYPE attribute that identifies its data type before any content-encodings specified in the ContentEncoding attribute were applied to the statement.

6.2.6 Component

6.2.6.1 Syntax
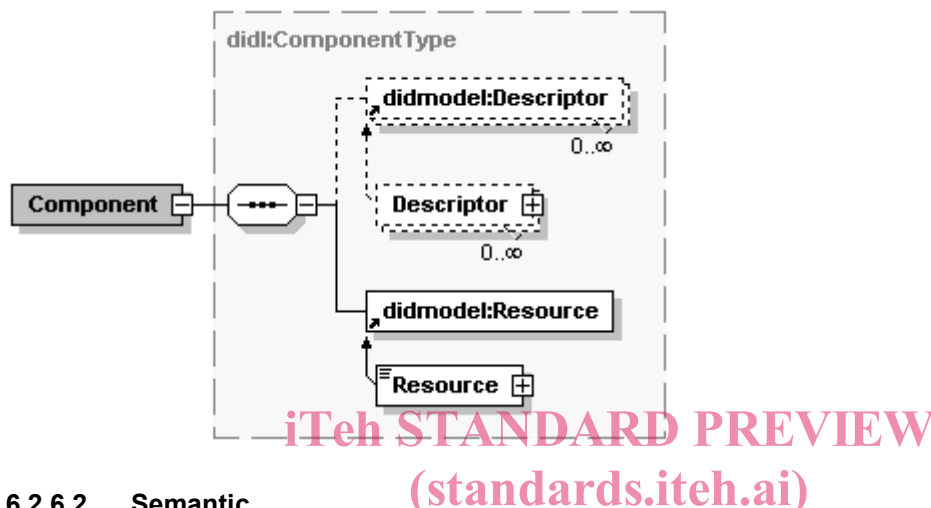
6.2.6.2 Semantic

The Component element groups a Resource element with a set of Descriptors containing descriptive information about the Resource. The Component, being a logical union of a resource with relevant descriptive data, is intended to be the basic building block of digital content within a DIDL document.

The following Descriptors must be supported within the Component:

- Identifier

- RelatedIdentifier

- MPEG-7

- Rights expressions

Every Item must have exactly one Descriptor within the component containing identification information about the item. Several Descriptors can be used to reference to related items. The identification information is based on ISO/IEC 21000-3 and is described in 6.3 more detailed. In 6.4 and 6.5 the MPEG-7 Metadata and the Rights expressions are explained. Both have to be present for each item exactly once.

A Component may have any attribute from other namespaces. Such attributes provide an additional representation of a Descriptor and as such contain descriptive information about the Resource by means of an attribute of the Component.