
**Information technology — Multimedia
framework (MPEG-21) —**

**Part 7:
Digital Item Adaptation**

**AMENDMENT 1: DIA Conversions and
Permissions**

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

Partie 7: Adaptation d'article numérique

AMENDEMENT 1: Conversions et droits d'accès DIA

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.

© ISO/IEC 2006

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

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.

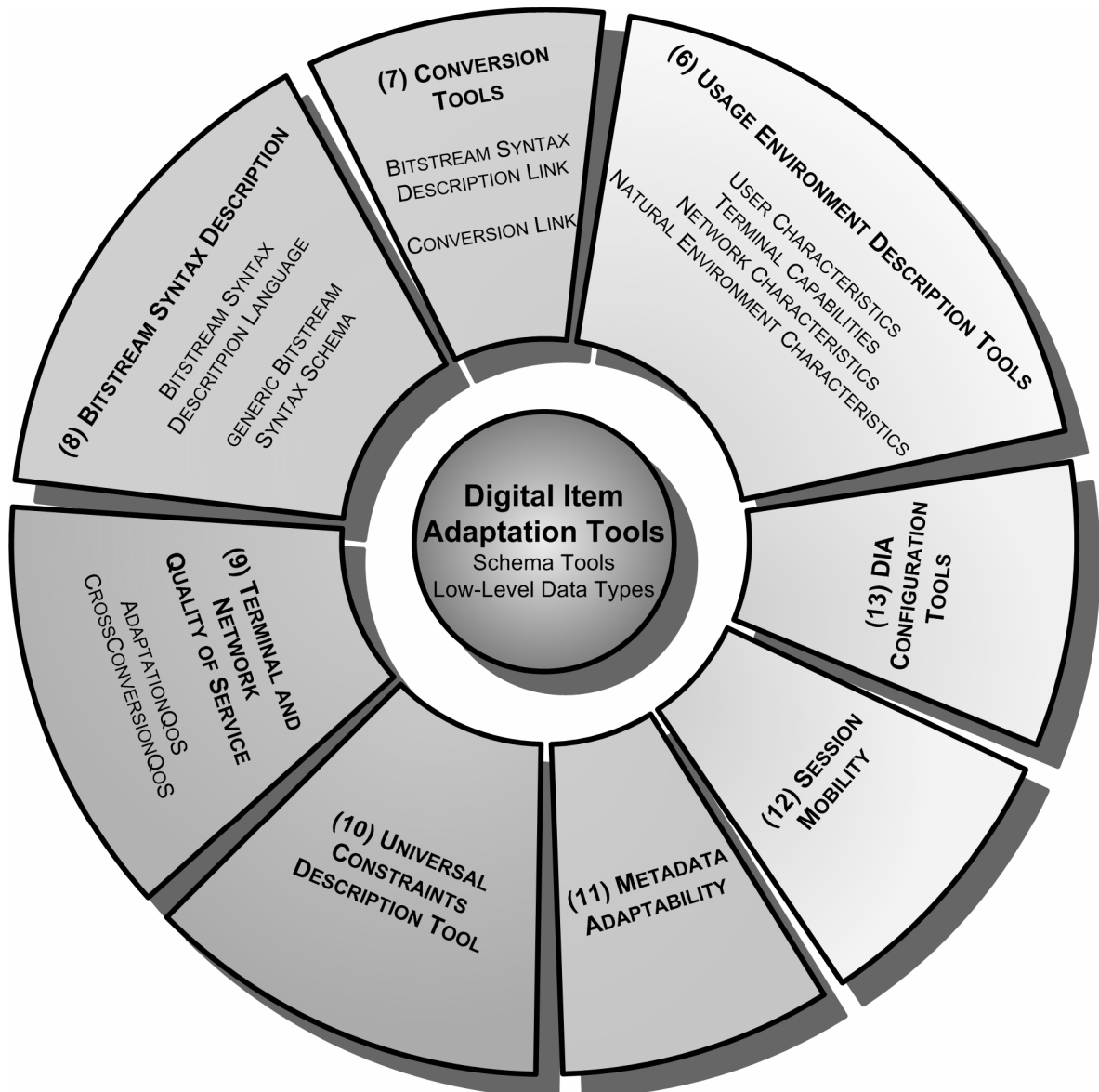
Amendment 1 to ISO/IEC 21000-7:2004 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

Information technology — Multimedia framework (MPEG-21) —

Part 7: Digital Item Adaptation

AMENDMENT 1: DIA Conversions and Permissions

In subclause 1.4, replace Figure 2 with the following figure:



In subclause 1.4, replace the following text:

The second category is referred to as *BSDLink* which provides the facilities to create a rich variety of adaptation architectures based on tools specified within this part of ISO/IEC 21000, ISO/IEC 21000-2, and ISO/IEC 15398 among others. The syntax and semantics of this tool is specified in clause 7.

with:

The second category is referred to as *Conversion Tools* which provides the facilities to create a rich variety of adaptation architectures based on tools specified within this part of ISO/IEC 21000, ISO/IEC 21000-2, and ISO/IEC 15398 among others. The syntax and semantics of this tool is specified in clause 7.

In subclause 1.5, remove the following text:

This specification deals with adaptation but specifically does not address the relationship of rights and permissions to adaptations. The relationship of rights and permissions is to be addressed in an amendment to this part of ISO/IEC 21000. It is expected that users of this part of ISO/IEC 21000 will register terms describing their specific adaptations with the Registration Authority described in ISO/IEC 21000-6 in order to provide interoperability.

Append a new paragraph at the end of this subclause with the following text:

ISO/IEC 21000-5 and ISO/IEC 21000-6 provide the tools to permit playing, modifying, and adapting by controlling the kinds of things that can be changed. This part of ISO/IEC 21000 provides tools for use with ISO/IEC 21000-5 to provide the means by which that control over the changes that can occur when playing, modifying, or adapting digital items and their component resources can be effected. It is expected that users of this part of ISO/IEC 21000 will register terms describing their specific adaptations with the Registration Authority described in ISO/IEC 21000-6 in order to provide interoperability.

In subclause 3.4, in Table 1, append the following three additional rows:

r	urn:mpeg:mpeg21:2003:01-REL-R-NS
sx	urn:mpeg:mpeg21:2003:01-REL-SX-NS
mx	urn:mpeg:mpeg21:2003:01-REL-MX-NS

Insert a new subclause 3.1.3 as follows:

3.1.3 Conversion and permission-specific terms and definitions

3.1.3.1

Conversion

A process that changes the characteristics of a **resource**.

NOTE In general a conversion performs the act as defined by the ISO/IEC 21000-6 term *adapt*.

3.1.3.2

Conversion act

A **conversion** and its parameters, including the actual name of the parameters. The semantics shall be defined through ISO/IEC 21000-6.

3.1.3.3

Conversion tool

A hardware and/or software module that implements a **conversion act** in order to perform the **conversion** as specified by the ISO/IEC 21000-6 term defining this **conversion**.

Insert a new subclause 5.6 as follows:

5.6 Conversion descriptions

5.6.1 Introduction

Subclause 5.6 specifies conversion descriptions identifying conversions. Conversion descriptions and parameters can be defined within this part of ISO/IEC 21000 by referencing appropriate ISO/IEC 21000-6 terms which specify the semantics of the conversion as well as its parameters. The conversion description tool as specified within subclause 5.6 provides a basic abstract type for a subset of types that can be used for defining conversions and permissions.

5.6.2 Syntax

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- ISO/IEC 21000-7, AMD/1: Conversions and Permissions -->
<!-- Schema for Conversion Descriptions -->
<schema
  version="ISO/IEC 21000-7:2004/Amd.1"
  id="ConvD-AMD1.xsd"
  targetNamespace="urn:mpeg:mpeg21:2003:01-DIA-NS"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:dia="urn:mpeg:mpeg21:2003:01-DIA-NS"
  elementFormDefault="qualified" attributeFormDefault="unqualified">

  <include schemaLocation="BSDLink-AMD1.xsd"/>

  <!-- ##### -->
  <!-- Definition of ConversionDescriptionBaseType -->
  <!-- ##### -->

  <complexType name="ConversionDescriptionBaseType" abstract="true">
    <complexContent>
      <extension base="dia:DIADescriptionType">
        <sequence>
          <element name="ConversionActUri">
            <complexType>
              <attribute name="uri" type="anyURI" use="required"/>
            </complexType>
          </element>
          <element name="Parameter" type="dia:BaseParameterType"
            minOccurs="0" maxOccurs="unbounded"/>
        </sequence>
      </extension>
    </complexContent>
  </complexType>

</schema>
```

5.6.3 Semantics

Semantics of the `ConversionDescriptionBaseType`:

Name	Definition
<code>ConversionDescriptionBaseType</code>	<p><code>ConversionDescriptionBaseType</code> extends <code>DIADescriptionType</code> and provides a base abstract type for a subset of types that can be used as part of the <code>ConversionCapabilitiesType</code>, <code>ConversionLinkType</code>, <code>ConversionUriType</code> and <code>PermittedDiaChanges</code> to identify a conversion.</p> <p>A conversion is defined by the conversion act which references a specialized ISO/IEC 21000-6 term and its parameters.</p>
<code>ConversionActUri</code>	Describes the conversion act using a reference to a specialized ISO/IEC 21000-6 term.
<code>uri</code>	Describes the reference to the specialized ISO/IEC 21000-6 term.
<code>Parameter</code>	Describes an input parameter to the conversion tool as defined by the specialized ISO/IEC 21000-6 term.

5.6.4 Example

EXAMPLE See subclause 6.5.29 Example 4, and subclause 14.6 for examples of conversion descriptions.

Insert the following as a new subclause 6.5.28 and increment subsequent subclauses accordingly:

6.5.28 ConversionCapabilities

6.5.28.1 Introduction

This subclause specifies the conversion capabilities of a terminal which express the types of conversions that a terminal is capable of performing.

6.5.28.2 Syntax

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- ISO/IEC 21000-7, AMD/1: Conversions and Permissions -->
<!-- Schema for ConversionCapabilities -->
<schema
  version="ISO/IEC 21000-7:2004/Amd.1"
  id="ConvCapab-AMD1.xsd"
  targetNamespace="urn:mpeg:mpeg21:2003:01-DIA-NS"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:dia="urn:mpeg:mpeg21:2003:01-DIA-NS"
  elementFormDefault="qualified" attributeFormDefault="unqualified">

  <include schemaLocation="UCD.xsd"/>
  <include schemaLocation="UED.xsd"/>
```

```

<include schemaLocation="ConvD-AMD1.xsd"/>

<!-- ##### -->
<!-- Definition of ConversionCapabilitiesType -->
<!-- ##### -->

<complexType name="ConversionCapabilitiesType">
  <complexContent>
    <extension base="dia:TerminalCapabilityBaseType">
      <sequence>
        <element name="ConversionCapability"
          type="dia:ConversionCapabilityType"
          minOccurs="0" maxOccurs="unbounded"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<!-- ##### -->
<!-- ConversionCapabilityType -->
<!-- ##### -->

<complexType name="ConversionCapabilityType">
  <complexContent>
    <extension base="dia:ConversionDescriptionBaseType">
      <sequence>
        <any namespace="##other" processContents="lax" minOccurs="0"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

</schema>

```

6.5.28.3 Semantics

Semantics of the ConversionCapabilitiesType:

Name	Definition
ConversionCapabilitiesType	Tool for describing the conversions that a terminal is capable of performing.
	NOTE 1 Each child shall be a conversion capability description that identifies a conversion the terminal is capable of performing.
ConversionCapability	Describes a conversion that a terminal is capable of performing.

Semantics of the ConversionCapabilityType:

Name	Definition
ConversionCapabilityType	Tool for describing a conversion that a terminal is capable of performing.

Name	Definition
any	Describes a conversion that a terminal is capable of performing using XML.
	NOTE 2 Provides an extension mechanism which allows the inclusion of conversion descriptions defined within other parts of ISO/IEC 21000 or even other standardization bodies.

In subclause 6.5.29, append the following text:

EXAMPLE 4 This example describes a terminal capable of dithering and scaling.

```
<DIA>
  <Description xsi:type="TerminalsType">
    <Terminal>
      <TerminalCapability xsi:type="ConversionCapabilitiesType">
        <ConversionCapability>
          <ConversionActUri uri="urn:mpeg:mpeg21:2003:01-RDD-NS:dither"/>
        </ConversionCapability >
        <ConversionCapability>
          <ConversionActUri uri="http://www.adaptationRUs.com/scale"/>
        </ConversionCapability >
      </TerminalCapability>
    </Terminal>
  </Description>
</DIA>
```

Change the heading of clause 7 to “Conversion tools” and replace the text of the clause as follows:

7 Conversion tools

7.1 Introduction

This clause specifies syntax and semantics of the conversion tools. The conversion tools include the BSDLink and ConversionLink tools. The former provides means for linking a steering description to Bitstream Syntax Descriptions (BSDs) enabling the BSD-based adaptation approach based on the decisions provided by the steering description. The latter is complementary to the BSDLink tool and provides means for linking steering description to general-purpose conversions not covered by the BSDLink tool, e.g., transcoding or summarization.

7.2 Bitstream syntax description link

Include the ISO/IEC 21000-7:2004 text of clause 7 here, demoting each heading one level.

Replace the text of subclause 7.2.2 with the following text:

```
<?xml version="1.0"?>
<!-- Digital Item Adaptation ISO/IEC 21000-7 -->
<!-- Schema for Bitstream syntax description link -->
<schema
  version="ISO/IEC 21000-7:2004/Amd.1"
```

```

id="BSDLink-AMD1.xsd"
xmlns="http://www.w3.org/2001/XMLSchema"
xmlns:dia="urn:mpeg:mpeg21:2003:01-DIA-NS"
targetNamespace="urn:mpeg:mpeg21:2003:01-DIA-NS"
elementFormDefault="qualified" attributeFormDefault="unqualified">

<include schemaLocation="DIA.xsd"/>

<!-- ##### -->
<!-- Definition of the BSDLinkType -->
<!-- ##### -->

<complexType name="BSDLinkType">
  <complexContent>
    <extension base="dia:DIADescriptionType">
      <sequence>
        <element ref="dia:SteeringDescriptionRef" minOccurs="0"/>
        <element name="BSDRef" type="dia:ReferenceType"/>
        <element ref="dia:BitstreamRef" minOccurs="0"/>
        <element name="BSDTransformationRef" maxOccurs="unbounded">
          <complexType>
            <complexContent>
              <restriction base="anyType">
                <attribute name="uri" type="anyURI" use="required"/>
                <attribute name="type" type="anyURI" use="optional"/>
              </restriction>
            </complexContent>
          </complexType>
        </element>
        <element name="Parameter" type="dia:BaseParameterType" minOccurs="0"
          maxOccurs="unbounded"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<!-- ##### -->
<!-- Definition of the SteeringDescriptionRef -->
<!-- ##### -->

<element name="SteeringDescriptionRef" type="dia:ReferenceType"/>

<!-- ##### -->
<!-- Definition of the BitstreamRef -->
<!-- ##### -->

<element name="BitstreamRef">
  <complexType>
    <attribute name="uri" type="anyURI" use="required"/>
  </complexType>
</element>

<!-- ##### -->
<!-- Definition of the SteeringDescriptionType -->
<!-- ##### -->

```

```

<complexType name="SteeringDescriptionType" abstract="true">
  <complexContent>
    <extension base="dia:DIADescriptionType"/>
  </complexContent>
</complexType>

<!-- ##### -->
<!-- Definition of the BaseParameterType -->
<!-- ##### -->

<complexType name="BaseParameterType" abstract="true">
  <complexContent>
    <extension base="dia:DIABaseType">
      <attribute name="name" type="QName" use="required"/>
    </extension>
  </complexContent>
</complexType>

<!-- ##### -->
<!-- Definition of the ConstantType -->
<!-- ##### -->

<complexType name="ConstantType">
  <complexContent>
    <extension base="dia:BaseParameterType">
      <sequence>
        <element name="Value" type="string"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<!-- ##### -->
<!-- Definition of the IOPinRefType -->
<!-- ##### -->

<complexType name="IOPinRefType">
  <complexContent>
    <extension base="dia:BaseParameterType">
      <sequence>
        <element name="Value" type="anyURI"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

</schema>

```

7.3 Conversion link

7.3.1 Introduction

This subclause specifies the syntax and semantics of the ConversionLink tool. The ConversionLink is similar to BSDLink in the way that this tool provides the facilities to link so-called steering description tools and conversion descriptions in a flexible and extensible way. However, though both tools do target conversions, the BSDLink tool targets basically the adaptation of scalable bitstreams whereas the ConversionLink tool is applicable for any kind of adaptations, e.g., transcoding, transforming, or transmoding.

The ConversionLink tool eases the referencing of information assets which can be used for conversion, i.e., references to these assets are stored in the ConversionLink. This description contains at least a reference to a conversion act which specifies the semantics of a conversion and the semantics of its generic parameters including the actual name of the parameters. Additionally, the ConversionLink tool may contain a reference to a steering description which governs the whole conversion process, a reference to the actual resource subject to the conversion and possibly a description of this resource.

A conversion decision architecture compatible with Annex B is given in Annex J.

7.3.2 ConversionLink syntax

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- Digital Item Adaptation ISO/IEC 21000-7 -->
<!-- Schema for Conversion link -->
<schema
  version="ISO/IEC 21000-7:2004/Amd.1"
  id="ConvL-AMD1.xsd"
  targetNamespace="urn:mpeg:mpeg21:2003:01-DIA-NS"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:dia="urn:mpeg:mpeg21:2003:01-DIA-NS"
  elementFormDefault="qualified" attributeFormDefault="unqualified">

  <include schemaLocation="BSDLink-AMD1.xsd"/>
  <include schemaLocation="ConvD-AMD1.xsd"/>

  <!-- ##### -->
  <!-- Definition of the ConversionLinkType -->
  <!-- ##### -->

  <complexType name="ConversionLinkType">
    <complexContent>
      <extension base="dia:ConversionDescriptionBaseType">
        <sequence>
          <element ref="dia:SteeringDescriptionRef" minOccurs="0"/>
          <element ref="dia:BitstreamRef" minOccurs="0"/>
          <element name="ResourceDescriptionRef" minOccurs="0">
            <complexType>
              <attribute name="uri" type="anyURI" use="required"/>
            </complexType>
          </element>
        </sequence>
      </extension>
    </complexContent>
  </complexType>

  <!-- ##### -->
  <!-- ConversionCompositeType -->
  <!-- ##### -->

  <complexType name="ConversionCompositeType">
    <complexContent>
      <extension base="dia:DIADescriptionType">
        <sequence>
          <element name="ConversionDescription" type="dia:ConversionLinkType"
minOccurs="2" maxOccurs="unbounded"/>
        </sequence>
      </extension>
    </complexContent>
  </complexType>

</schema>
```

7.3.3 ConversionLink semantics

Semantics of the `ConversionLinkType`:

Name	Definition
<code>ConversionLinkType</code>	Tool for describing suggested conversions as a link between the parameters provided by a steering description and the parameters required for a conversion.
<code>SteeringDescriptionRef</code>	Describes a reference to the steering description. The target of this reference shall be of <code>SteeringDescriptionType</code> . If this element is not present the conversion should be steered by the ISO/IEC 21000-2 choice/selection mechanism.
<code>ResourceDescriptionRef</code>	Describes a reference to a description of the resource subject to the conversion. If this element is present, this description can be used by the resource conversion tools.
<code>BitstreamRef</code>	Describes a reference to the bitstream subject to the conversion. NOTE If this element is not present the bitstream should be either provided by the application or the ISO/IEC 21000-2 <code>Resource</code> element.

Semantics of `ConversionCompositeType`:

Name	Definition
<code>ConversionCompositeType</code>	Tool for describing a conversion as a composite of other conversion links in sequence such that the conversions are given by its child elements and the order is given by the sequence of its child elements.
<code>ConversionDescription</code>	Describes a single conversion as part of the composite conversion.

7.3.4 Example

EXAMPLE The following `ConversionLink` example uses an `AdaptationQoS` description to provide the scaling factor for the conversion, which is used for spatial scaling of the JPEG image, and the required color components according to the terminal capabilities.

An Adaptation Decision-Taking Engine (ADTE) based on an `AdaptationQoS` description gets the values of the display resolution and the display color capabilities for the respective I/O pins and then looks up the values of the corresponding `SCALE` and `NR_COLORS` by processing the `AdaptationQoS` modules. The obtained values of the IOPins `SCALE` and `NR_COLORS` are then used by the `ConversionLink` to pass parameters to the actual image conversion tool which implements the conversion act URI.

```

<DIA>
  <Description xsi:type="ConversionLinkType">
    <ConversionActUri uri="urn:mpeg:mpeg21:2003:01-RDD-NS:ImageRescaleGrayScale"/>
    <Parameter xsi:type="IOPinRefType" name="rescale">
      <Value>SCALE</Value>
    </Parameter>
    <Parameter xsi:type="IOPinRefType" name="colors">
      <Value>NR_COLORS</Value>
    </Parameter>
    <SteeringDescriptionRef uri="#akiyo AQoS"/>
    <BitstreamRef uri="akiyo.jpg"/>
  </Description>
</DIA>

```

Insert a new subclause 9.10 as follows:

9.10 CrossConversionQoS

9.10.1 Introduction

Subclause 9.10 specifies syntax and semantics of the CrossConversionQoS tool. A resource may be adapted by different methods, (referred herein as conversion options). Normally, each conversion option is associated with an AdaptationQoS description, so the adaptation engine can find an appropriate conversion level of that conversion option. When there are more than one conversion options available, the CrossConversionQoS tool helps the adaptation engine to select the best conversion option (i.e., with the highest quality) given certain constraints. The quality of a conversion option can be computed from the utilities provided by the AdaptationQoS description of that conversion option, or manually assigned by the provider. Besides elements for quality assessment, CrossConversionQoS has a reference to ConversionLink or BSDLink, which provides the details of a conversion option.

9.10.2 CrossConversionQoS syntax

```

<?xml version="1.0"?>
<!-- Digital Item Adaptation ISO/IEC 21000-7 -->
<!-- Schema for Cross Conversion QoS -->
<schema
  version="ISO/IEC 21000-7:2004/Amd.1"
  id="CCQoS-AMD1.xsd"
  targetNamespace="urn:mpeg:mpeg21:2003:01-DIA-NS"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:dia="urn:mpeg:mpeg21:2003:01-DIA-NS"
  xmlns:mpeg7="urn:mpeg:mpeg7:schema:2001"
  elementFormDefault="qualified" attributeFormDefault="unqualified">

  <include schemaLocation="AQoS.xsd"/>
  <import namespace="urn:mpeg:mpeg7:schema:2001"
    schemaLocation="mpeg7-udp-2003.xsd"/>

  <!-- ##### -->
  <!-- Definition of CrossConversionQoSType -->
  <!-- ##### -->

  <complexType name="CrossConversionQoSType">
    <complexContent>
      <extension base="dia:DIADescriptionType">
        <sequence>
          <element name="ConversionOption" type="dia:ConversionOptionType"

```