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Information technology — Multimedia service platform technologies —

Part 4:
Elementary services

Technologies de l'information — Technologies de la plate-forme de services multimédia —

Partie 4: Services élémentaires

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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 23006-4 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

This second edition cancels and replaces the first edition (ISO/IEC 23006-4:2010), which has been technically revised.

ISO/IEC 23006 consists of the following parts, under the general title *Information technology — Multimedia service platform technologies*:

— *Part 1: Architecture*

— *Part 2: MPEG extensible middleware (MXM) API*

— *Part 3: Conformance and reference software*

— *Part 4: Elementary services*

— *Part 5: Service aggregation*

Introduction

ISO/IEC 23006 is a suite of standards that has been developed for the purpose of enabling the easy design and implementation of media-handling value chains whose devices interoperate because they are all based on the same set of technologies accessible from the middleware.

ISO/IEC 23006 is referred as MPEG Extensible Middleware (MXM) in its first edition, and it specifies an architecture (Part 1), an API (Part 2), a reference software (Part 3) and a set of protocols which MXM Devices had to adhere (Part 4).

ISO/IEC 23006 is referred as Multimedia Service Platform Technologies (MSPT) in its second edition, and it conserves the architecture and design philosophy of the first edition, but stressing the Service Oriented Architecture character. It specifies also how to combine elementary services into aggregated services (Part 5).

This second edition has been specified to address the demand of service specification for an advanced IPTV terminal (AIT). The ISO/IEC 23006 suite of standards also aims at leveraging on advanced technologies to bring into IPTV services the buoyancy of new exciting initiatives – sometimes assembling millions of users in a fortnight – that pop up almost every day with new features such as open APIs and the possibility for third parties to provide applications to those APIs.

This enables the development of a global market of:

— MSPT applications that can run on MSPT devices, like Advanced IPTV Terminals (AITs), thanks to the existence of a standard MSPT application API

— MSPT devices executing MSPT applications thanks to the existence of a standard MSPT architecture

— MSPT engines thanks to the existence of standard MSPT architecture and standard APIs

— Innovative business models because of the ease to design and implement media-handling value chains whose devices interoperate because they are all based on the same set of technologies, especially MPEG technologies.

Information technology — Multimedia service platform technologies —

Part 4:
Elementary services

1 Scope

This part of ISO/IEC 23006 specifies a set of Elementary Services and protocols enabling distributed applications to exchange information related to content items and parts thereof, including all the necessary Operations on MPEG-related Entities: Content, Contract, Device, Event, License, Service and User. These operations are defined to be the following: Authenticate, Authorize, Check With, Create, Deliver, Describe, Identify, Install, Interact With, Negotiate, Package, Post, Present, Process, Request, Revoke, Search, Store, Transact, Uninstall and Verify. Elementary Services can be combined in well defined sequences to build Aggregated Services, both of them being called in general Multimedia Services. ISO/IEC 23006 (all parts) will be referred to as MPEG-M for short in the text. The Multimedia Services are provided by and consumed by Multimedia Devices in a MSPT ecosystem, an example of which is the Advanced IPTV Terminal.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 14496-13, *Information technology — Coding of audio-visual objects — Part 13: Intellectual Property Management and Protection (IPMP) extensions*

ISO/IEC 15938-1, *Information technology — Multimedia content description interface — Part 1: Systems*

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

ISO/IEC 15938-12, *Information technology — Multimedia content description interface — Part 12: Query format*

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 21000-4, *Information technology — Multimedia framework (MPEG-21) — Part 4: Intellectual Property Management and Protection Components*

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

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

ISO/IEC 21000-17, *Information technology — Multimedia framework (MPEG-21) — Part 17: Fragment Identification of MPEG Resources*

ISO/IEC 21000-20, *Information technology — Multimedia framework (MPEG-21) — Part 20: Contract Expression Language*

ISO/IEC 23000-5, *Information technology — Multimedia application format (MPEG-A) — Part 5: Media streaming application format*

ISO/IEC 23001-2, *Information technology — MPEG systems technologies — Part 2: Fragment request units*

ISO/IEC 23001-3, *Information technology — MPEG systems technologies — Part 3: XML IPMP messages*

ISO/IEC 23005-2, *Information technology — Media context and control — Part 2: Control Information*

ISO/IEC 23005-3, *Information technology — Media context and control — Part 3: Sensory Information*

ISO/IEC 23006-1, *Information technology — Multimedia service platform technologies — Part 1: Architecture*

ISO/IEC 23006-2, *Information technology — Multimedia service platform technologies — Part 2: MPEG Extensible Middleware (MXM) API*

ISO/IEC 23006-3, *Information technology — Multimedia service platform technologies — Part 3: Reference software*

IETF RFC 2616, *Hypertext Transfer Protocol — HTTP/1.1*, IETF Request For Comments, June 1999

IETF RFC 3614, *A Uniform Resource Name (URN) Namespace for the Motion Picture Experts Group (MPEG)*, IETF Request For Comments, September 2003

OASIS SAML-CORE-2.0-OS, *Assertions and Protocols for the OASIS Security Assertion Markup Language (SAML) V2.0*, OASIS Standard, 15 March 2005

OMG BPMN 2.0, *Business Process Model and Notation (BPMN) Version 2.0*, Object Management Group, January 2011

W3C SOAP, *SOAP Version 1.2 Part 1: Messaging Framework (Second Edition)*, W3C Recommendation, 27 April 2007

W3C WSDL, *Web Services Description Language (WSDL) Version 2.0 Part 1: Core Language*, W3C Recommendation, 26 June 2007

W3C XML, *Extensible Markup Language (XML) 1.0 (Fourth Edition)*, W3C Recommendation, 29 September 2006

W3C XMLNAMES, *Namespaces in XML 1.0 (Second Edition)*, W3C Recommendation, 16 August 2006

W3C XMLSCHEMA, *XML Schema Part 1: Structures Second Edition and XML Schema Part 2: Datatypes Second Edition*, W3C Recommendations, 28 October 2004

W3C XPATH1, *XML Path Language (XPath) Version 1.0*, W3C Recommendation, 16 November 1999

W3C XSL, *XSL Transformations (XSLT) Version 2.0*, W3C Recommendation, 23 January 2007

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

3.1.1
Aggregated Service
service resulting from the combination of **Elementary Service**s

3.1.2
Elementary Service
basic unit of **service**

3.1.3
content
Digital Item and its component elements, namely resources (e.g., media, scripts, executable), identifiers, descriptions (e.g., metadata), event reports

3.1.4
contract
set of **metadata**, **licenses**, promises and signers agreed by **Users** of a multimedia value chain, where a promise is a signed collection of statements about, e.g., obligations, prohibitions and assertions, and a signer is a **user** whose signature makes the contract valid

3.1.5
device
hardware/software or simply software apparatus that enables a **user** to play a role in multimedia **value chain**s

3.1.6
event
performance of a specified set of functions or **Operations**

3.1.7
entity
one of the following elements in the multimedia value chain: **content**, **contract**, **device**, **event**, **license**, **service**, and **user**

3.1.8
governance
ability to control, direct or oversee the behavior of each **entity** or operation in an multimedia **value chain**

3.1.9
license
collection of authorizations, conditions and payment terms granted by a **user** to other **user**s

3.1.10
operation
process in which an **Entity** is altered or manipulated

3.1.11
protocol
set of rules and data format used by two **Device**s to communicate

3.1.12
rate
function of expressing the perceived ranking of an **entity** related to a metric

3.1.13
remunerate
function of assigning money to a **user** in exchange of **right**s

3.1.14
reputation
measure of the credibility of or the possibility (e.g., legal) for a **user** to be a party in a transaction

3.1.15
resource
individually identifiable asset or a sequence of assets such as a video or audio clip, a 3D synthetic scene, an image, a textual asset, a 2D LASeR scene, a web page, a single program or a full 24 hour programming of a TV broadcast, a script or executable etc.

3.1.16
right
ability of a **user** to perform an Operation in the multimedia **value chain**

3.1.17
role
ability of a **user** to perform a set of Operations in the multimedia **value chain**

3.1.18
service
operation performed on an **entity** by a **user** on behalf of other **user**s

3.1.19
service definition
specification of a **Service** in terms of interfaces, protocols as well as syntax and semantics of the protocol data formats

3.1.20
service instance
particular implementation of a **Service**

3.1.21
service instance declaration
description of a **Service Instance** in terms of provider, connection end-points, and usage conditions

3.1.22
service provider
user offering **service**s to other **user**s

3.1.23
space shifting
function of consuming content on a **device** (Device Shifting), or at a place (Space Shifting) or at a time (Time Shifting) different than the one intended by the rights holder

3.1.24
tag
free text descriptive information attached to an **entity**

3.1.25
user
any participant in multimedia **value chains**

3.1.26
value chain
collection of **user**s, including Creators, End Users and Service Providers, that conform to this standard

3.2   Abbreviated terms

For the purposes of this document, the abbreviated terms given in the following apply:

AIK	Attestation Identity Key
AIT	Advanced IPTV Terminal
AS	Aggregated Service
ATIS	Alliance for Telecommunications Industry Solutions
BBL	Bitstream Binding Language
BPMN	Business Process Model and Notation
CEL	Contract Expression Language
CRID	Content Reference Identifier
CS	Classification Scheme
DB	Database
DI	Digital Item
DIA	Digital Item Adaptation
DID	Digital Item Declaration
DIDL	Digital Item Declaration Language
DVB	Digital Video Broadcasting
DII	Digital Item Identification
EPG	Electronic Program Guide
ER	Event Report
ERR	Event Report Request
ES	Elementary Service
ETSI	European Telecommunications Standards Institute
FRU	Fragment Request Unit
FUU	Fragment Update Unit
HTTP	Hypertext Transfer Protocol
IIF	IPTV Interoperability Forum
IPMP	Intellectual Property Management and Protection
IPTV	Internet Protocol Television
LASeR	Lightweight Application Scene Representation
MDS	Multimedia Description Schemes
MIME	Multipurpose Internet Mail Extensions
MPEG	Moving Picture Experts Group
MPEG-4	Coding of audio-visual objects (see ISO/IEC 14496)
MPEG-7	Multimedia Content Description Interface Standard (see ISO/IEC 15938)
MPEG-21	Multimedia Framework (see ISO/IEC 21000)
MPEG-A	Multimedia application format (see ISO/IEC 23000)
MPEG-M	Multimedia Service Platform Technologies (see ISO/IEC 23006)
MPEG-V	Media Context and Control (see ISO/IEC 23005)

MPQF	MPEG Query Format
MSPT	Multimedia Service Platform Technologies
NER	Named Entity Recognition
OWL	Web Ontology Language
PCR	Platform Configuration Registers
POS	Part of Speech
RDF	Resource Description Framework
REL	Rights Expression Language
RTP	Real-Time Transport Protocol
SAML	Security Assertion Markup Language
SDP	Session Description Protocol
SID	Service Instance Declaration
SLA	Service Level Agreement
SNR	Signal-to-Noise Ratio
SP	Service Provider
SPARQL	SPARQL Protocol and RDF Query Language
SVC	Scalable Video Coding
TCPA	Trusted Computing Platform Alliance
TESP	Transact Entity Service Provider
TPM	Trusted Platform Module
TSS	Trusted Software Stack
UED	Usage Environment Description
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
VAT	Value Added Tax
W3C	World Wide Web Consortium
WSDL	Web Services Description Language
XML	Extensible Markup Language
XSD	XML Schema Definition
XSLT	Extensible Stylesheet Language Transformations

4 Namespaces and conventions

4.1 Namespaces

4.1.1 Introduction

URN namespaces defined in this Part of ISO/IEC 23006 conform to RFC 3614. The "standard name" used as prefix of the namespace specific string of URN namespaces defined in this Part of ISO/IEC 23006 is "mpegM".

NOTE   Although RFC 3614 specifies the "standard name" to be case-insensitive, some tools might be incapable of handling this case insensitivity properly. Thus, alternative capitalizations are discouraged.

4.1.2 Schema namespaces

The value of the namespace URI for W3C XMLSCHEMA Schema definitions of base type used commonly by all Elementary Services in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:schema:01-base-NS:2012

The value of the namespace URI for XML Schema definitions of Elementary Service protocol messages in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:schema:02-service-NS:2012

The value of the namespace URI for XML Schema definitions of the BPMN 2.0 extension for message flow references in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:schema:04-bpmn-ext-mfr-NS:2012

The value of the namespace URI for XML Schema definitions of Service Instance Declarations in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:schema:05-sid-NS:2012

The value of the namespace URI for XML Schema definitions of the MPEG-21 DIDL extension in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:schema:06-didl-NS:2012

The value of the namespace URI for XML Schema definitions of the MPEG-M IPMP Info Profile in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:schema:07-IPMPINFO-NS:2012

The value of the namespace URI for XML Schema definitions of the MPEG-M IPMP DIDL Profile in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:schema:08-IPMPDIDL-NS:2012

4.1.3 BPMN namespaces

The value of the namespace URI for BPMN 2.0 XML representations in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:bpmn:01-service-NS:2012

4.1.4 Service Type namespaces

The value of the namespace URI for XML Schema definitions of the Service Type "Recognize Speech" in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:service-type:01-recognize-speech-NS:2012

The value of the namespace URI for XML Schema definitions of the Service Type "Synthesize Speech" in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:service-type:02-synthesize-speech-NS:2012

The value of the namespace URI for XML Schema definitions of the Service Type "Extract Sensory Information" in this Part of ISO/IEC 23006 is:

```
urn:mpeg:mpegM:service-type:03-extract-sensory-information-NS:2012
```

The value of the namespace URI for XML Schema definitions of the Service Type "Content Adaptation" in this Part of ISO/IEC 23006 is:

```
urn:mpeg:mpegM:service-type:04-content-adaptation-NS:2012
```

The value of the namespace URI for XML Schema definitions of the Service Type "Process Language" in this Part of ISO/IEC 23006 is:

```
urn:mpeg:mpegM:service-type:05-process-language-NS:2012
```

The value of the namespace URI for XML Schema definitions of the Service Type "Translate Language" in this Part of ISO/IEC 23006 is:

```
urn:mpeg:mpegM:service-type:05-translate-language-NS:2012
```

The value of the namespace URI for XML Schema definitions of the Service Type "Resource Transcoding" in this Part of ISO/IEC 23006 is:

```
urn:mpeg:mpegM:service-type:05-resource-transcoding-NS:2012
```

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9c8b77ecae23/iso-iec-23006-4-2013

The value of the namespace URI for XML Schema definitions of the Service Type "Stream Repurposing" in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:service-type:06-stream-repurposing-NS:2012

4.1.5 Classification Scheme namespaces

The value of the namespace URI for Classification Schemes for IPTV offering discovery sections in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:cs:02-iptvods-NS:2012

The value of the namespace URI for Classification Schemes for various MPEG-M Elementary Services in this Part of ISO/IEC 23006 is:

    urn:mpeg:mpegM:cs:03-es-NS:2012

4.2 Namespace convention

For clarity, throughout this Part of ISO/IEC 23006, consistent namespace prefixes are used.

"`xml:`" and "`xmlns:`" are normative prefixes defined in W3C XMLNAMES. The prefix "`xml:`" is by definition bound to "`http://www.w3.org/XML/1998/namespace`". The prefix "`xmlns:`" is used only for namespace bindings and is not itself bound to any namespace name.

"`xsi:`" prefix is not normative. It is a naming convention in this document to refer to an element of the `http://www.w3.org/2001/XMLSchema-instance` namespace. All other prefixes used in either the text or examples of this specification are not normative, e.g., "`mpegm:`", "`dia:`".

In particular, most of the informative examples in this specification are provided as XML fragments without the normally required XML document declaration and, thus, miss a correct namespace binding context declaration.

Unless specified otherwise, all unqualified descriptions fragments assume the default namespace "`urn:mpeg:mpegM:schema:02-service-NS:2012`".

In these descriptions fragments the different prefixes are bound to the namespaces as given in Table 1. The schema locations of the namespaces in Table 1 are only an informative indication as schema locations may change over time.

Table 1 — Mapping of prefixes to namespaces used in examples and text

Prefix	Corresponding namespace	Schema location
xsd	http://www.w3.org/2001/XMLSchema	http://www.w3.org/2001/XMLSchema.xsd
xsi	http://www.w3.org/2001/XMLSchema-instance	
bbl	urn:mpeg:mpeg21:2007:01-BBL-NS	http://standards.iso.org/ittf/PubliclyAvailableStandards/MPEG-21_schema_files/dis/bbl.xsd
bpmn	http://www.omg.org/spec/BPMN/20100524/MODEL	http://www.omg.org/spec/BPMN/20100501/BPMN20.xsd