INTERNATIONAL STANDARD

ISO/IEC 23005-6

Fourth edition
2019-04

Information technology — Media context and control —

Part 6: Common types and tools

Technologies de l'information — Contrôle et contexte de supports —

Partie 6: Types communs et outils

Reference number
ISO/IEC 23005-6:2019(E)

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms, definitions and abbreviated terms ... **1**
3.1 Terms and definitions ... 2
3.2 Abbreviated terms ... 3
4 Common types ... **3**
4.1 General ... 3
4.2 Schema wrapper conventions ... 3
4.3 Mnemonics for binary representations ... 4
4.4 Common header for binary representations ... 4
4.4.1 General ... 4
4.4.2 XML representation syntax ... 4
4.4.3 Binary representation syntax ... 4
4.4.4 Descriptor components semantics ... 5
4.5 Basic datatypes ... 6
4.5.1 General ... 6
4.5.2 Syntax ... 6
4.5.3 Binary representation syntax ... 6
4.5.4 Semantics ... 6
4.6 Color-related datatypes ... 7
4.6.1 General ... 7
4.6.2 Syntax ... 7
4.6.3 Binary representation syntax ... 8
4.6.4 Semantics ... 9
4.6.5 Additional validation rules ... 11
4.7 Time stamp type ... 11
4.7.1 General ... 11
4.7.2 Syntax ... 11
4.7.3 Binary representation syntax ... 12
4.7.4 Semantics ... 13
5 Profiles ... **14**
5.1 Media orchestration profile ... 14
5.1.1 General ... 14
5.1.2 Sensors and sensor capabilities used in media orchestration profile ... 15
5.1.3 Media orchestration profile, Level 1 ... 15
Annex A (normative) **Classification schemes** ... **23**
Annex B (informative) **Schema documents** ... **122**
Annex C (informative) **Complete information for media orchestration profile** ... **123**
Bibliography ... **143**

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see http://patents.iec.ch).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

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

This fourth edition cancels and replaces the third edition (ISO/IEC 23005-6:2016), which has been technically revised.

The main changes compared to the previous edition are as follows:

— New classifications schemes such as 3D printer file format type CS, 3D printer type CS, printing material type CS, printing material characteristics type CS, and odor sensor technology CS are added.

— Definition of media orchestration profile is added.

A list of all parts in the ISO/IEC 23005 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The ISO/IEC 23005 series (MPEG-V) provides an architecture and specifies information representation of data flowing in and out of the real world and virtual worlds.

The data for the real world are communicated through sensors and actuators. The data for virtual worlds consist of properties of virtual objects and multi-sensorial data embedded in audio-visual content. MPEG-V specifies data formats for sensors, actuators, virtual objects, and audio-visual content.

Data captured from the real world could need to be adapted for use in a virtual world and data from virtual worlds could also need to be adapted for use in the real world. The ISO/IEC 23005 series does not specify how the adaptation is carried out but only specifies the interfaces.

Data for sensors are sensor capabilities, sensed data, and sensor adaptation preferences.

Data for actuators are sensory device capabilities, sensory device commands, and sensory effect preferences.

Data for virtual objects are characteristics of avatars and virtual world objects.

Data for audio-visual content are sensory effects.

This document contains the data types and tools (e.g., timestamp, unit, normative vocabularies) which are used in more than one part of the ISO/IEC 23005 series. This document also specifies standard profiles and levels to be used in specific application domains.

Annex B contains details of the schema for this document.

The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this document may involve the use of patents.

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Company	Address
Samsung Electronics Co.Ltd.	416, Maetan-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, 152-848, Korea
Gwangju Institute of Science and Technology	261 Cheomdan - gwagiro (Oryong-dong), Buk-gu, Gwang-ju 500-712, Korea
Electronics and Telecommunications Research Institute (ETRI)	218 Gajeongno, Yuseong-gu, Daejeon, 305-700, Korea
Konkuk University	1 Hwayang-dong, Gwangjin-gu, Seoul, 143-701, Korea

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Information technology — Media context and control —

Part 6:
Common types and tools

1 Scope

This document provides definitions of data types and tools, which are used in other parts of the ISO/IEC 23005 series, but are not specific to a single part.

This document specifies syntax and semantics of the data types and tools common to the tools defined in the other parts of the ISO/IEC 23005 series, such as basic data types which are used as basic building blocks in more than one of the tools in the ISO/IEC 23005 series, colour-related basic types which are used in light and colour-related tools to help in specifying colour-related characteristics of the devices or commands, and time stamp types which can be used in device commands, and sensed information to specify timing related information.

Classification schemes, which provide semantics of words or terms and normative way of referencing them, are also defined in Annex A, if they are used in more than one part of the ISO/IEC 23005 series.

The tools defined in this document are not intended to be used alone, but to be used as a part or as a supporting tool of other tools defined in other parts of the ISO/IEC 23005 series, except for the profile and level definitions.

This document also contains standard profiles and levels to be used in specific application domains. The profile and level definitions include collection of tools from ISO/IEC 23005-2 and ISO/IEC 23005-5 with necessary constraints.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 15938-3, *Information technology — Multimedia content description interface — Part 3: Visual*

ISO/IEC 15938-5:2003, *Information technology — Multimedia content description interface — Part 5: Multimedia description schemes*

3 Terms, definitions and abbreviated terms

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

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3.1 Terms and definitions

3.1.1
adaptation engine
adaptation RV and/or adaptation VR

3.1.2
adaptation VR
entity that takes the *sensory effect metadata* (3.1.14), the *sensory device* (actuator) *capabilities* (3.1.11), the *sensor capabilities* (3.1.9), and/or the *user's sensory preferences* (3.1.16) as inputs and generates *sensory device* (actuator) *commands* (3.1.12) and/or the *sensed information* (3.1.6) based on those and then takes the *sensor capabilities* (3.1.9) as inputs and the *sensed information* (3.1.6) from sensors and adapts the *sensed information* (3.1.6) based on the *sensor capabilities* (3.1.9)

EXAMPLE RoSE Engine.

3.1.3
adaptation RV
entity that takes the *sensed information* (3.1.6) from sensors, the *sensor capabilities* (3.1.9) and/or the *sensor adaptation preferences* (3.1.8) as inputs and adapts the *sensed information* (3.1.6) and/or the *virtual world object characteristics* (3.1.16) based on those inputs

3.1.4
interaction device
device that accepts inputs from users and/or gives output to users in the form of various modalities

3.1.5
provider
entity that acts as the source of the *sensory effect metadata* (3.1.14)

EXAMPLE Broadcaster.

3.1.6
sensed information
information acquired by a sensor

3.1.7
sensor
consumer device by which user input or environmental information can be gathered

EXAMPLE Temperature sensor, distance sensor, motion sensor, etc.

3.1.8
sensor adaptation preferences
description to represent preferences of individual users regarding the *sensed information* (3.1.6)

3.1.9
sensor capability
description to represent the characteristics of *sensors* (3.1.7) in terms of the capability of the given *sensor* (3.1.7) such as accuracy, or sensing range

3.1.10
sensory device
consumer device (actuator) by which the corresponding *sensory effect* (3.1.13) can be made

EXAMPLE Light, fan, heater, etc.

3.1.11
sensory device capability
description to represent the characteristics of actuators used to generate *sensory effects* (3.1.13) in terms of the capability of the given device

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3.1.12
sensory device command
description to control actuators used to generate *sensory effects* (3.1.13)

3.1.13
sensory effect
effect to augment perception by stimulating human senses in a particular scene of a multimedia application

EXAMPLE Scent, wind, light, haptic [kinesthetic-force, stiffness, weight, friction, texture, widget (button, slider, joystick), tactile: air-jet, suction pressure, thermal, current, vibration, etc.]

Note 1 to entry: Combinations of tactile display can also provide directional, shape information.

3.1.14
sensory effect metadata
defines the description schemes and descriptors to represent *sensory effects* (3.1.13)

3.1.15
user's sensory preferences
description schemes and descriptors to represent user's preferences with respect to rendering of *sensory effects* (3.1.13)

3.1.16
virtual world object characteristics
descriptions used to characterize a virtual world object, making it possible to migrate a virtual world object (or only its characteristics) from one virtual world to another and to control a virtual world object in a virtual world by real world devices

3.2 Abbreviated terms

MPEG-21	ISO/IEC 21000 series
DIA	digital item adaptation (see ISO/IEC 21000-7)
URI	uniform resource identifier (IETF RFC 3986)
URL	uniform resource locator (IETF RFC 3986)
XML	extensible markup language (W3C, http://www.w3.org/XML/)
RoSE	representation of sensory effects

4 Common types

4.1 General

This clause describes types common to more than one part of the ISO/IEC 23005 series including the schema wrapper conventions, basic data types, color related data types, and time stamp type. The types defined in this clause are defined to be used in combination with tools defined in other parts of the ISO/IEC 23005 series, and are not intended to be instantiated by themselves.

4.2 Schema wrapper conventions

The syntax defined in this clause assumes the following schema wrapper to form a valid XML schema document.

```
<schema xmlns="http://www.w3.org/2001/XMLSchema_
"xmlns:mpeg7="urn:mpeg:mpeg7:schema:2004" xmlns:mpegvct="urn:mpeg:mpeg-v:2016:01-CT-NS"
targetNamespace="urn:mpeg:mpeg-v:2016:01-CT-NS"
```

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