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

**Part 1:
Vision, Technologies and Strategy**

*Technologies de l'information — Cadre multimédia (MPEG-21) —
Partie 1: Vision, Technologies et Stratégie*



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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 3.

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.

In exceptional circumstances, the joint technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when the joint technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this part of ISO/IEC TR 21000 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 TR 21000-1, which is a Technical Report of type 3, 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 TR 21000 consists of the following parts, under the general title *Information technology — Multimedia framework (MPEG-21)*:

- *Part 1: Vision, Technologies and Strategy*
- *Part 2: Digital Item Declaration*
- *Part 3: Digital Item Identification and Description*
- *Part 4: Intellectual Property Management and Protection*
- *Part 5: Rights Expression Language*
- *Part 6: Rights Data Dictionary*

Further parts may be added.

Executive Summary

Today, many elements exist to build an infrastructure for the delivery and consumption of multimedia content. There is, however, no 'big picture' to describe how these elements, either in existence or under development, relate to each other. The aim for MPEG-21 is to describe how these various elements fit together. Where gaps exist, MPEG-21 will recommend which new standards are required. ISO/IEC JTC 1/SC 29/WG 11 (MPEG) will then develop new standards as appropriate while other relevant standards may be developed by other bodies. These specifications will be integrated into the multimedia framework through collaboration between MPEG and these bodies.

The result is an open framework for multimedia delivery and consumption for use by all the players in the delivery and consumption chain. This open framework thus provides content creators and service providers with equal opportunities in the MPEG-21 enabled open market. This will also be to the benefit of the content consumer providing them access to a large variety of content in an interoperable manner.

The vision for MPEG-21 is to define a multimedia framework *to enable transparent and augmented use of multimedia resources across a wide range of networks and devices* used by different communities.

Part 1 of MPEG-21 (ISO/IEC TR 21000-1):

1. Provides a *vision* for a multimedia framework to enable transparent and augmented use of multimedia resources across a wide range of networks and devices to meet the needs of all Users¹;
2. Facilitates the integration of components and standards in order to harmonise *technologies* for the creation, management, manipulation, transport, distribution and consumption of content;
3. Provides a *strategy* for achieving a multimedia framework by the development of specifications and standards based on well-defined functional requirement through collaboration with other bodies.

¹ A User is any entity that interacts in the MPEG-21 environment or makes use of a Digital Item (all capitalised terms are used as defined in Clause 2).

Introduction

Currently, multimedia technology provides the different players in the multimedia value and delivery chain (from content creators to end-users) with an excess of information and services. Access to information and services from almost anywhere at anytime can be provided with ubiquitous terminals and networks. However, no complete solutions exist that allow different communities, each with their own models, rules, procedures, interests and content formats, to interact efficiently using this complex infrastructure. Examples of these communities are the content, financial, communication, computer and consumer electronics sectors and their customers. Developing a common multimedia framework will facilitate co-operation between these sectors and support a more efficient implementation and integration of the different models, rules, procedures, interests and content formats. This will enable an enhanced user experience.

The multimedia content delivery chain encompasses content creation, production, delivery and consumption. To support this, the content has to be identified, described, managed and protected. The transport and delivery of content will occur over a heterogeneous set of terminals and networks within which events will occur and require reporting. Such reporting will include reliable delivery, the management of personal data and preferences taking user privacy into account and the management of (financial) transactions.

The MPEG-21 multimedia framework identifies and defines the key elements needed to support the multimedia delivery chain as described above, the relationships between and the operations supported by them. Within the parts of MPEG-21, MPEG will elaborate the elements by defining the syntax and semantics of their characteristics, such as interfaces to the elements. MPEG-21 will also address the necessary framework functionality, such as the protocols associated with the interfaces, and mechanisms to provide a repository, composition, conformance, etc.

The seven key elements defined in this document are:

1. Digital Item Declaration (a uniform and flexible abstraction and interoperable schema for declaring Digital Items);
2. Digital Item Identification and Description (a framework for identification and description of any entity regardless of its nature, type or granularity);
3. Content Handling and Usage (provide interfaces and protocols that enable creation, manipulation, search, access, storage, delivery, and (re)use of content across the content distribution and consumption value chain);
4. Intellectual Property Management and Protection (the means to enable Digital Items and their rights to be persistently and reliably managed and protected across a wide range of networks and devices);
5. Terminals and Networks (the ability to provide interoperable and transparent access to content across networks and terminals);
6. Content Representation (how the media resources are represented);
7. Event Reporting (the metrics and interfaces that enable Users to understand precisely the performance of all reportable events within the framework).

MPEG-21 recommendations will be determined by interoperability requirements, and their level of detail may vary for each framework element. The actual instantiation and implementation of the framework elements below the abstraction level required to achieve interoperability, will not be specified.

Information technology — Multimedia framework (MPEG-21) —

Part 1: Vision, Technologies and Strategy

1 Scope

This Technical Report has been prepared within ISO/IEC JTC 1/SC 29/WG 11 to introduce the MPEG-21 Multimedia Framework. It identifies the requirements that need to be met to achieve the definition of this framework. It is proposed that this will be achieved through a combination of WG 11's efforts to standardise the parts of the multimedia framework where it has the appropriate expertise, and the integration with standards initiatives which are being developed by other bodies. It is expected that this collaborative approach to standardisation linked with a common vision will maximise harmonisation of efforts and enable effective standards solutions to be implemented in the shortest possible time.

The Technical Report is introduced by a problem statement and a solution statement. The problem statement describes a multimedia usage environment founded upon ubiquitous networks that is encouraging new business models for trading digital content. In this environment, the distinction between content types is less clear as their integration as multimedia resources in new products and services makes the traditional boundaries less distinct. In addition, individuals are becoming increasingly aware of the value, both commercial and intrinsic, of their own digital asset resources and new possibilities presented by the tools which enable them to create and collect, package and distribute content. The solution statement introduces the vision of the multimedia framework to support transactions that are interoperable and highly automated, which is required to support these new types of commerce.

Seven architectural elements are identified as key to the multimedia framework as previously described in the Scope of the Technical Report. In addition, the user requirements within a multimedia framework are described separately as they impact upon each of the seven architectural elements.

In creating its definition of a multimedia framework and in making its proposals and recommendations for further standardisation, it is necessary for MPEG-21 to take account of other related multimedia activities. The Technical Report identifies other multimedia initiatives that are currently in progress that should be considered as candidates for future interaction and collaboration with the standards work plan agreed by MPEG-21.

2 Terms and Definitions

For the purposes of this Technical Report, the following terms and definitions apply:

2.1 Anchor

An Anchor associates Descriptors with a fragment of a media resource and provides an externally identifiable target for links from a location within a media resource.

2.2 Container

A potentially hierarchical structure that allows Digital Items to be grouped.

2.3 Digital Item

A Digital Item is a structured digital object with a standard representation, identification and meta-data within the MPEG-21 framework. This entity is also the fundamental unit of distribution and transaction within this framework.