*American National Standard*

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*Information technology - Multimedia Middleware - Part 5: Component download*

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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 23004-5 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 23004 consists of the following parts, under the general title *Information technology — Multimedia Middleware*:

⎯ *Part 1: Architecture*

⎯ *Part 2: Multimedia application programming interface (API)*

⎯ *Part 3: Component model*

⎯ *Part 4: Resource and quality management*

⎯ *Part 5: Component download*

⎯ *Part 6: Fault management*

⎯ *Part 7: System integrity management*

# Introduction

The Download Framework has been developed as part of M3W to fulfill the requirements concerning upgrading and extension of operational M3W-based systems. During the period that a CE device is owned by a user, there is often a need to improve and/or extend the device's software in order to extend the economic lifetime of the device.

In the Component lifecycle, the Download Framework is responsible for transferring M3W Components from a Repository to a Target (see Figure 1).
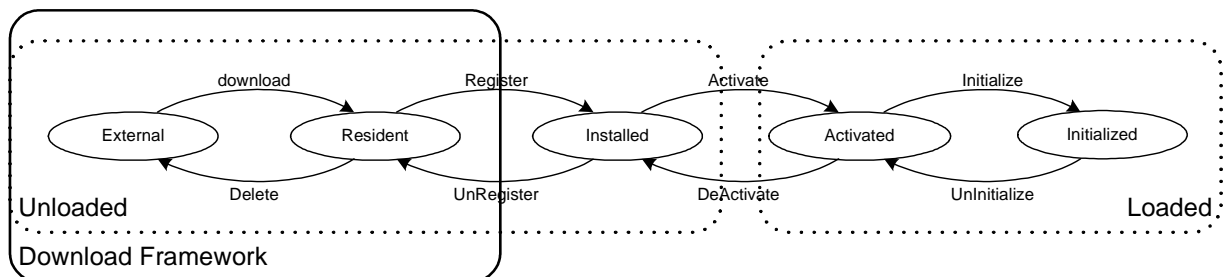


**Figure 1 — Scope Download Framework**

The download process takes a Component in its "installable Component" stage and downloads it to the Target, which brings the Component in its "resident" state. This is a very macroscopic view on the download process which, when elaborated, reveals the following constituent activities of the download process.

— **Identify need for download:** This activity describes the part in which the need for the presence of a given Component on a given M3W system is identified.

— **Entities are located:** After the need for download is realized, the place from where the Component can be retrieved, as well as its destination, must be identified. Also, the place where the decision about the feasibility of the download will be established must be identified, in case it is an entity other than the sender or the receiver.

— **Connection establishment:** The sender and the receiver in the context of the download for a specific Component establish a connection between them in order to proceed with the download process.

— **Security checks:** Using the connection between them, the server and the receiver run a number of security checks (e.g. mutual authentication, authorization for the download, payment guarantees to cover the costs of the Component as well as the cost of the download process).

— **Feasibility analysis:** This activity includes a number of checks and verifications to ensure that the Component can be installed and activated at its destination while it still satisfies its specifications and without putting in danger the rest of the M3W system at its destination.

— **Transmission properties:** A number of negotiations regarding the security and reliability characteristics of the data transmission as well as providing certain necessary information (e.g. the payment token like credit card number, payment certificate).

— **Component transmission:** This activity comprises the actual transfer of the data that constitute the Component and which includes at least the data corresponding to the representation of the executable model of a Component.

— **Connection termination:** This activity contains all actions necessary for the sender and the receiver to keep consistent information about the final status of the data transfer (and hence the download process so far). If this activity is completed successfully, the remaining parts of the download process necessitate only the participation of the receiver.

The remainder of this part of ISO/IEC 23004 contains the specification of the Download Framework. This specification describes the Download Framework from a number of perspectives.

— The decomposition into roles is described in the Structure View (8.1).

— The interaction between these roles is described in the Behavior View (8.2).

— The deployment of these roles is described in Deployment View (8.3).

# Information technology — Multimedia Middleware —

## Part 5:
## Component download

## 1　Scope

This part of ISO/IEC 23004 defines the MPEG Multimedia Middleware (M3W) technology Download Architecture. This definition contains the specification of the part of the M3W application programming interface (API) related to download as well as the realization. The M3W API specification provides a uniform view of the download functionality provided by M3W. The specification of the realization is relevant for those who are making an implementation of a download framework for M3W.

## 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/IEC 23004-1, *Information technology — Multimedia Middleware — Part 1: Architecture*

ISO/IEC 23004-3, *Information technology — Multimedia Middleware — Part 3: Component model*

## 3　Terms and definitions

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

### 3.1　Specification terms and definitions

#### 3.1.1
#### API specification
specification of a collection of software interfaces providing access to coherent streaming-related functionality

#### 3.1.2
#### interface suite
collection of mutually related interfaces providing access to coherent functionality

#### 3.1.3
#### logical component
coherent unit of functionality that interacts with its environment through explicit interfaces only

#### 3.1.4
#### role
abstract class defining behavior only

#### 3.1.5
#### role instance
object displaying the behavior defined by the role