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Information technology — Multimedia Middleware —

Part 6:
Fault management

Technologies de l'information — Intergiciel multimédia —

Partie 6: Gestion des anomalies
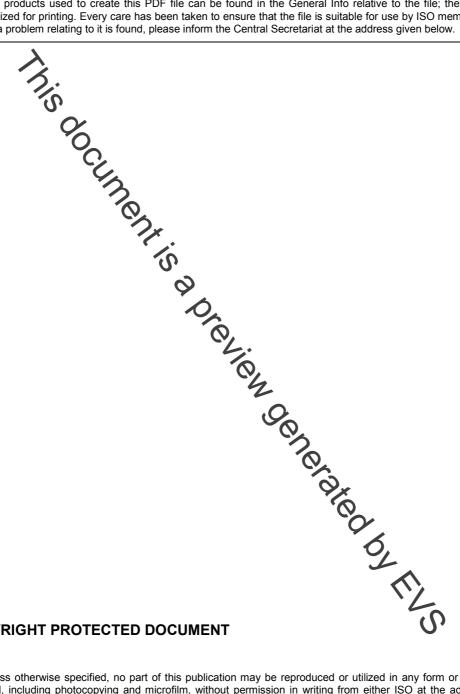
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Foreword

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 23004-6 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 Multimedia Middleware (M3W) Fault Management Framework provides mechanisms for adding fault tolerance techniques (e.g. error detection and recovery) to an existing system. These techniques deal with errors occurring in Service Instances created from Components that are not trusted, without modifying these Components and without relying on reflection. The Fault Management Framework is restricted to the definition of these mechanisms; the actual fault tolerance techniques are system dependent and outside its scope.

Fault management is done by means of intercepting and redirecting Service instantiation and interface method invocations by inserting a new entity in-between, called the "Middleman". The Fault Management Framework also defines a Fault Manager for coordinating several Middlemans[1]. Collectively, the Middlemans and Fault Managers provide the fault tolerance techniques.

Finally, the Fault Management Framework may interact with the (remote) System Integrity Management Framework in order to support fault removal.

The purpose of the Fault Management Framework is to enable component-based systems to operate failure-free despite the presence of faults in their Components (fault-tolerance). For a running system, fault-tolerance is based on error detection, confinement, and recovery. The Fault Management Framework aims to (enable) stopping error propagation by handling the detected errors and not letting them lead to a failure.

The Fault Management Framework provides mechanisms to add fault management to existing systems and Components. It does not address the design and implementation of new Components that may incorporate some fault management techniques such as those found in fault-tolerant systems.

The M3W Fault Management Framework should allow a large number of known or future fault-tolerance techniques to be incorporated.

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1) The word "Middlemans" is used as the plural of Middleman, since a Middleman is not a human.

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1 Scope

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