INTERNATIONAL STANDARD

ISO/IEC 14478-3

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Information technology — Computer graphics and image processing — Presentation Environment for Multimedia Objects (PREMO) —

Part 3:
Multimedia Systems Services

Technologies de l'information — Infographie et traitement d'images — Environnement de présentation d'objets multimédia (PREMO) —

Partie 3: Services pour les systèmes multimédia

Reference number
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Contents

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, government 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 JTC1. Draft International Standards adopted by the joint technical committees are circulated to the national bodies for voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

ISO/IEC 14478–3 was prepared by Joint Technical Committee ISO/IEC JTC1, *Information technology*, Subcommittee SC24, *Computer graphics and image processing*.

This International Standard currently consists of the following four parts under the general title *Information technology — Computer graphics and image processing — Presentation environments for multimedia objects (PREMO):*

- *Part 1: Fundamentals of PREMO*
- *Part 2: Foundation Component*
- *Part 3: Multimedia Systems Services*
- *Part 4: Modelling, Rendering, and Interaction Component*

Annex A forms an integral part of this part of ISO/IEC 14478. Annexes B to D are for information only.

Introduction

The Multimedia Systems Services (MSS) component of PREMO provides a standard set of services that can be used by multimedia application developers in a variety of computing environments. Enabling multimedia applications in a heterogeneous, distributed computing environment is the design motivation for the MSS. This is an increasingly prevalent computing model, and a solution that meets the needs of this environment can more easily be scaled to stand–alone systems than vice versa.

The principal reasons for defining the MSS are:

a) provide abstractions and mechanisms that make it possible for applications to deal with the problems of distributed multimedia computing successfully;

b) facilitate the implementation of complex applications, such as video conferencing;

c) provide abstractions that make it possible for applications to deal with media devices without regard to specific characteristics of the platform, attached devices, or the network(s) connecting the platforms and devices;

d) to provide a standard methodology, especially for handling "live" data;

e) insure scalability to large organizations;

f) insure adequate performance in adverse conditions;

g) facilitate Quality of Service commitments; and

h) consider the time critical nature of the data.

The primary goal of the MSS is to provide an infrastructure for building multimedia computing platforms that support interactive multimedia applications dealing with synchronized, time–based media in a heterogeneous distributed environment. Operation in a distributed environment is important because of significant trends in the computer industry towards client/server and collaborative computing. Another significant trend is towards multimedia enabled computing. The inevitable result will be an intersection of these trends to produce a distributed multimedia environment with a topology similar to Figure 1.

The MSS is intended to address a broad range of application needs. It extends the multimedia capabilities of stand-alone computers to capabilities that are usable both locally and remotely. The Multimedia Systems Services gives applications the ability to handle:

i) live data remotely;

j) stored data remotely;

k) both live and stored data simultaneously;

l) multiple kinds of data simultaneously; and

m) new kinds of devices and media types.

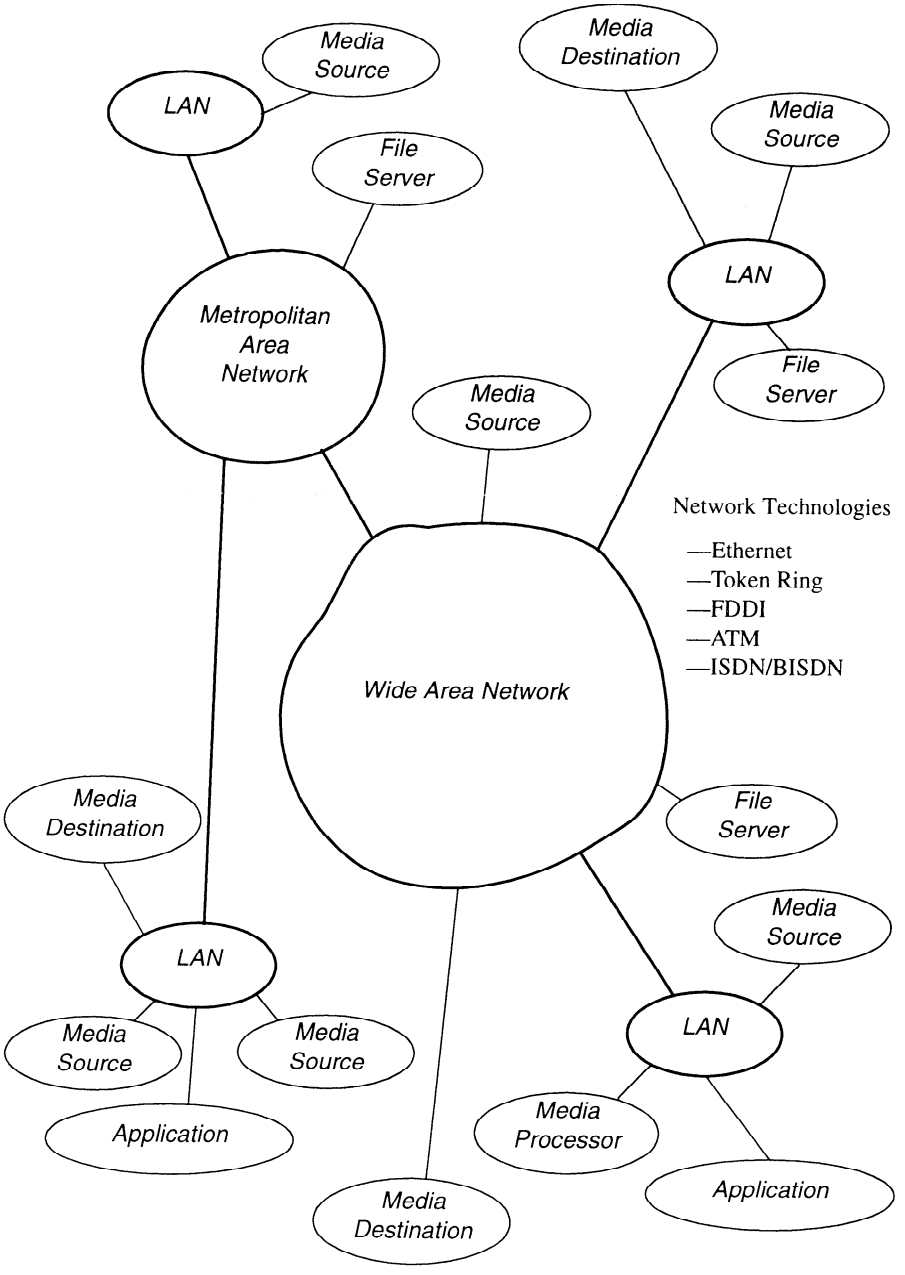

Figure 1 — Distributed multimedia environment

To provide support for remote media device control and remote media access that derive from the above application scenarios, the Multimedia System Services uses two distinct mechanisms. To support interaction with remote objects, the Multimedia Systems Services depends upon an underlying object model and infrastructure, as described in ISO/IEC 14478–1 (PREMO). To support the media independent streaming of time critical data, the Multimedia Systems Services defines a Media Stream Control.

The MSS does not address:

n) encryption and security;

o) intellectual property rights and accounting;

p) scripting;

q) user interfaces; or

r) sharing of data between applications.

Information technology — Computer graphics and image processing — Presentation Environment for Multimedia Objects (PREMO) — Part 3: Multimedia Systems Services

1 Scope

This part of ISO/IEC 14478 defines a standard set of multimedia system services that can be used by multimedia application developers in a variety of computing environments. The focus is on enabling multimedia applications in a heterogeneous, distributed computing environment. Throughout this part of ISO/IEC 14478, this component will also be referred to as "Multimedia Systems Services", and abbreviated as MSS.

The Multimedia Systems Services constitutes a framework of "middleware" — system software components lying in the region between the generic operating system and specific applications. As middleware, the Multimedia Systems Services marshals lower–level system resources to the task of supporting multimedia processing, providing a set of common services which can be used by multimedia application developers.

The Multimedia Systems Services encompasses the following characteristics:

a) provision of an abstract type for a media processing node, extensible through subtyping to support abstractions of real media processing hardware or software;

b) provision of an abstract type for the data flow path or the connection between media processing nodes, encapsulating low–level connection and transport semantics;

c) grouping of multiple processing nodes and connections into a single unit for purposes of resource reservation and stream control;

d) provision of a media dataflow abstraction, with support for a variety of position, time and/or synchronization capabilities;

e) separation of the media format abstractions from the dataflow abstraction;

f) synchronous exceptions and asynchronous events;

g) application visible characterization of object capabilities;

h) registration of objects in a distributed environment by location and capabilities;

i) retrieval of objects in a distributed environment by location and constraints;

j) definition of a Media Stream Protocol to support media independent transport and synchronization.

The Multimedia Systems Services rely on the object model of ISO/IEC 14478-1 (Fundamentals of PREMO) and the object types and non–object data types defined in ISO/IEC 14478-2 (PREMO Foundation Component).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 14478. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of this international standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 14478-1:1998, *Information technology — Computer graphics and image processing — Presentation Environment for Multimedia Objects (PREMO) — Part 1: Fundamentals of PREMO.*

ISO/IEC 14478-2:1998, *Information technology — Computer graphics and image processing — Presentation Environment for Multimedia Objects (PREMO) — Part 2: Foundation Component.*

ISO/IEC 14478-4:1998, *Information technology — Computer graphics and image processing — Presentation Environment for Multimedia Objects (PREMO) — Part 4: Modelling, Rendering, and Interaction Component.*

ISO/IEC 10918-1:1994, *Information technology — Digital Compression and Coding of Continuous–Tone Still Images (JPEG).*

ISO/IEC 11172:1992, *Information technology — Coding of Moving Pictures and Associated Audio for Digital Storage Media at up to about 1.5Mbit/s (MPEG).*