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Information technology — Meta Object Facility (MOF)

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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 19502 was prepared by the Object Management Group (OMG) and was adopted, under the PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

ISO/IEC 19502 is related to

- ISO/IEC 19501, *Information technology — Open Distributed Processing — Unified Modeling Language (UML) Version 1.4.2*
- ISO/IEC 19503, *Information technology — XML Metadata Interchange (XMI)*
- ISO/IEC 14769, *Information technology — Open Distributed Processing — Type Repository Function*

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Introduction

This International Standard defines a metamodel (defined using MOF), a set of interfaces (defined using ODP IDL (ITU-T Recommendation X.920 (1997) | ISO/IEC 14750:1999), that can be used to define and manipulate a set of interoperable metamodels and their corresponding models. It also defines the mapping from MOF to ODP IDL (ITU rec X920|ISO 14750). These interoperable metamodels include the Unified Modeling Language (UML) metamodel (ISO/IEC 19501:2005), the MOF meta-metamodel, as well as future standard technologies that will be specified using metamodels. The MOF provides the infrastructure for implementing design and reuse repositories, application development tool frameworks, etc. The MOF specifies precise mapping rules that enable the CORBA interfaces for metamodels to be generated automatically, thus encouraging consistency in manipulating metadata in all phases of the distributed application development cycle. Mappings from MOF to W3C XML and XSD are specified in the XMI (ISO/IEC 19503) specification. Mappings from MOF to Java™ are in the JMI (Java Metadata Interchange) specification defined by the Java Community Process.

In order to achieve architectural alignment considerable effort has been expended so that the UML and MOF share the same core semantics. This alignment allows the MOF to reuse the UML notation for visualizing metamodels. In those areas where semantic differences are required, well-defined mapping rules are provided between the metamodels. The UML has been the subject of a separate PAS submission.

The OMG adopted the MOF (version 1.0) in November 1997. It was developed as a response to a request for proposal, issued by the OMG Analysis and Design Task Force, for Metadata repository facility (<http://www.omg.org/cgi-bin/doc?cf/96-05-02>). The purpose of the facility was to support the creation, manipulation, and interchange of meta models. The most recent revision of MOF, 1.4 was adopted in April 2002, and includes corrections and clarifications to the original 1.3 version, and minor modeling feature additions.

The rapid growth of distributed processing has led to a need for a coordinating framework for this standardization and ITU-T Recommendations X.901-904 | ISO/IEC 10746, *Open Distributed Processing — Reference Model (RM-ODP)* provides such a framework. It defines an architecture within which support of distribution, interoperability, and portability can be integrated. RM-ODP Part 2 (ISO/IEC 10746-2) defines the foundational concepts and modeling framework for describing distributed systems. RM-ODP Part 3 (ISO/IEC 10746-3) specifies a generic architecture of open distributed systems, expressed using the foundational concepts and framework defined in Part 2.

While not limited to this context, this International Standard is closely related to work on the standardization of Open Distributed Processing (ODP). In particular, the ODP Type Repository Function (ISO/IEC 14769 | Rec. X.960) references the OMG Meta Object Facility, version 1.3. This function specifies how to use the OMG MOF as a repository for ODP types.

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Information technology — Meta Object Facility (MOF)

1 Scope

This International Standard specifies the following:

- a. An abstract language for specifying, constructing, and managing technology neutral metamodels: A metamodel is in effect an abstract language for some kind of metadata.
- b. A framework for implementing repositories & integration frameworks (e.g., tool integration frameworks) that hold metadata (e.g., models) described by the metamodels and which uses standard technology mappings to transform MOF metamodels into metadata APIs.

This International Standard also provides the following:

- a. A formal definition of the MOF meta-metamodel; that is, the abstract language for specifying MOF metamodels.
- b. A mapping from arbitrary MOF metamodels to CORBA IDL that produces IDL interfaces for managing any kind of metadata.
- c. A set of “reflective” CORBA IDL interfaces for managing metadata independent of the metamodel.
- d. A set of CORBA IDL interfaces for representing and managing MOF metamodels.
- e. An XMI format for MOF metamodel interchange (OMG XMI Specification).

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.

2.1 Identical Recommendations | International Standards

- ITU-T Recommendation X.902 (1996) | ISO/IEC 10746-2:1996, *Open Distributed Processing — Reference Model: Foundations*
- ITU-T Recommendation X.903 (1996) | ISO/IEC 10746-3:1996, *Open Distributed Processing — Reference Model: Architecture*

2.2 International Standards

- ISO/IEC 14769:2001, *Information technology — Open Distributed Processing — Type Repository Function*
- ISO/IEC 19501:2005, *Information technology — Open Distributed Processing — Unified Modeling Language (UML) Version 1.4.2*
- ISO/IEC 19503:2005, *Information technology — XML Metadata Interchange (XMI)*