
**Information technology — Object
Management Group Unified Modeling
Language (OMG UML) —**

**Part 2:
Superstructure**

iTeh STANDARD PREVIEW
*Technologies de l'information — Langage de modélisation unifié OMG
(OMG UML) —
Partie 2: Superstructure*
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO/IEC 19505 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

This International Standard was prepared by Technical Committee ISO/IEC/TC JTC1, Information technology, in collaboration with the Object Management Group (OMG), following the submission and processing as a Publicly Available Specification (PAS) of the OMG Unified Modeling Language (UML) specification.

This International Standard is related to:

- ITU-T Recommendations X.901-904 | ISO/IEC 10746, the Reference Model of Open Distributed Processing (RM-ODP).

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This International Standard consists of the following parts, under the general title *Information technology - Open distributed processing - UML specification*:

- Part 1: Infrastructure
- Part 2: Superstructure

Apart from this Foreword, the text of this International Standard is identical with that for the OMG specification for UML, v2.4.1, Part 2.

Introduction

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, the Reference Model of Open Distributed Processing (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. The scopes and objectives of the RM-ODP Part 2 and the UML, while related, are not the same and, in a number of cases, the RM-ODP Part 2 and the UML specification use the same term for concepts that are related but not identical (e.g., interface). Nevertheless, a specification using the Part 2 modeling concepts can be expressed using UML with appropriate extensions (using stereotypes, tags, and constraints).

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. Given the relation between UML as a modeling language and Part 2 of the RM ODP standard, it is easy to show that UML is suitable as a notation for the individual viewpoint specifications defined by the RM-ODP.

The Unified Modeling Language (UML) is a general-purpose modeling language with a semantic specification, a graphical notation, an interchange format, and a repository query interface. It is designed for use in object-oriented software applications, including those based on technologies recommended by the Object Management Group (OMG). As such, it serves a variety of purposes including, but not limited to, the following:

- a means for communicating requirements and design intent,
- a basis for implementation (including automated code generation),
- a reverse engineering and documentation facility

As an international standard, the various components of UML provide a common foundation for model and metadata interchange:

- between software development tools,
- between software developers, and
- between repositories and other object management facilities.

The existence of such a standard facilitates the communication between standardized UML environments and other environments.

While not limited to this context, the UML standard is closely related to work on the standardization of Open Distributed Processing (ODP).

Information technology - Object Management Group Unified Modeling Language (OMG UML), Superstructure

1 Scope

1.1 General

This International Standard defines the Unified Modeling Language (UML), revision 2. The objective of UML is to provide system architects, software engineers, and software developers with tools for analysis, design, and implementation of software-based systems as well as for modeling business and similar processes.

The initial versions of UML (UML 1) originated with three leading object-oriented methods (Booch, OMT, and OOSE), and incorporated a number of best practices from modeling language design, object-oriented programming, and architectural description languages. Relative to UML 1, this revision of UML has been enhanced with significantly more precise definitions of its abstract syntax rules and semantics, a more modular language structure, and a greatly improved capability for modeling large-scale systems.

One of the primary goals of UML is to advance the state of the industry by enabling object visual modeling tool interoperability. However, to enable meaningful exchange of model information between tools, agreement on semantics and notation is required. UML meets the following requirements:

- A formal definition of a common MOF-based metamodel that specifies the abstract syntax of the UML. The abstract syntax defines the set of UML modeling concepts, their attributes and their relationships, as well as the rules for combining these concepts to construct partial or complete UML models.
- A detailed explanation of the semantics of each UML modeling concept. The semantics define, in a technology-independent manner, how the UML concepts are to be realized by computers.
- A specification of the human-readable notation elements for representing the individual UML modeling concepts as well as rules for combining them into a variety of different diagram types corresponding to different aspects of modeled systems.
- A detailed definition of ways in which UML tools can be made compliant with this International Standard. This is supported (in a separate specification) with an XML-based specification of corresponding model interchange formats (XMI) that must be realized by compliant tools.

2 Conformance

2.1 General

UML is a language with a very broad scope that covers a large and diverse set of application domains. Not all of its modeling capabilities are necessarily useful in all domains or applications. This suggests that the language should be structured modularly, with the ability to select only those parts of the language that are of direct interest. On the other hand, an excess of this type of flexibility increases the likelihood that two different UML tools will be supporting different subsets of the language, leading to interchange problems between them. Consequently, the definition of compliance for UML requires a balance to be drawn between modularity and ease of interchange.