

Information technology — Open Distributed Processing — Reference Model: Foundations —

(ITU-T Rec. X.902 (1995) |
ISO/IEC 10746-2:1996)

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National foreword

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- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
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Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or using the “Find” facility of the BSI Standards Electronic Catalogue.

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Summary of pages

This document comprises a front cover, an inside front cover, the ISO/IEC title page, pages ii to iv, pages 1 to 16 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

This British Standard, having been prepared under the direction of the DISC Board, was published under the authority of the Standards Board and comes into effect on 15 March 1997

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**Information technology — Open
Distributed Processing — Reference Model:
Foundations**

*Technologies de l'information — Traitement distribué ouvert — Modèle de
référence: Fondations*



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Descriptors: Data processing, information interchange, network interconnection, open systems interconnection, data management, open distributed processing, reference models.

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. 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.

International Standard ISO/IEC 10746-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 21, *Open Systems Interconnection, data management and open distributed processing*, in collaboration with ITU-T. The identical text is published as ITU-T Recommendation X.902.

ISO/IEC 10746 consists of the following parts, under the general title *Information technology — Open Distributed Processing — Reference Model*:

- *Part 1: Overview*;
- *Part 2: Foundations*;
- *Part 3: Architecture*;
- *Part 4: Architectural semantics*.

Introduction

The rapid growth of distributed processing has led to a need for a coordinating framework for the standardization of Open Distributed Processing (ODP). This Reference Model of ODP provides such a framework. It creates an architecture within which support of distribution, interworking, and portability can be integrated.

The Reference Model of Open Distributed Processing (RM-ODP), ITU-T Recs. X.901 to X.904 | ISO/IEC 10746, is based on precise concepts derived from current distributed processing developments and, as far as possible, on the use of formal description techniques for specification of the architecture.

The RM-ODP consists of:

— ITU-T Rec. X.901 | ISO/IEC 10746-1:

Overview: Contains a motivational overview of ODP, giving scoping, justification and explanation of key concepts, and an outline of the ODP architecture. It contains explanatory material on how the RM-ODP is to be interpreted and applied by its users, who may include standards writers and architects of ODP systems. It also contains a categorization of required areas of standardization expressed in terms of the reference points for conformance identified in ITU-T Rec. X.903 | ISO/IEC 10746-3. This part is not normative.

— ITU-T Rec. X.902 | ISO/IEC 10746-2:

Foundations: Contains the definition of the concepts and analytical framework for normalized description of (arbitrary) distributed processing systems. It introduces the principles of conformance to ODP standards and the way in which they are applied. This is only to a level of detail sufficient to support ITU-T Rec. X.903 | ISO/IEC 10746-3 and to establish requirements for new specification techniques. This part is normative.

— ITU-T Rec. X.903 | ISO/IEC 10746-3:

Architecture: Contains the specification of the required characteristics that qualify distributed processing as open. These are the constraints to which ODP standards must conform. It uses the descriptive techniques from ITU-T Rec. X.902 | ISO/IEC 10746-2. This part is normative.

— ITU-T Rec. X.904 | ISO/IEC 10746-4:

Architectural semantics: Contains a formalization of the ODP modelling concepts defined in this Recommendation | International Standard (clauses 8 and 9). The formalization is achieved by interpreting each concept in terms of the constructs of the different standardized formal description techniques. This part is normative.

This Recommendation | International Standard does not contain any annexes.

1 Scope

This ITU-T Recommendation | International Standard covers the concepts which are needed to perform the modelling of ODP systems (see clauses 5 to 14), and the principles of conformance to ODP systems (see clause 15).

The concepts defined in clauses 5 to 15 are used in the Reference Model of Open Distributed Processing to support the definitions of:

- a) the structure of the family of standards which are subject to the Reference Model;
- b) the structure of distributed systems which claim compliance with the Reference Model (the configuration of the systems);
- c) the concepts needed to express the combined use of the various standards supported;
- d) the basic concepts to be used in the specifications of the various components which make up the open distributed system.

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

— ITU-T Recommendation X.903 (1995) | ISO/IEC 10746-3:1996, *Information technology — Open distributed processing — Reference Model: Architecture.*

3 Definitions

For the purposes of this Recommendation | International Standard, the following definitions apply.

3.1 definitions from other Recommendations | International Standards

there are no definitions from other Recommendations | International Standards in this Recommendation | International Standard

3.2 Background definitions

3.2.1 distributed processing

information processing in which discrete components may be located in different places, and where communication between components may suffer delay or may fail

3.2.2 ODP standards

this Reference Model and those standards that comply with it, directly or indirectly

3.2.3 open distributed processing

distributed processing designed to conform to ODP standards

3.2.4 ODP system

a system (see 6.5) which conforms to the requirements of ODP standards

3.2.5 information

any kind of knowledge, that is exchangeable amongst users, about things, facts, concepts and so on, in a universe of discourse

although information will necessarily have a representation form to make it communicable, it is the interpretation of this representation (the meaning) that is relevant in the first place

3.2.6 data

the representation forms of information dealt with by information systems and users thereof

3.2.7 viewpoint (on a system)

a form of abstraction achieved using a selected set of architectural concepts and structuring rules, in order to focus on particular concerns within a system

4 Abbreviations

For the purposes of this Recommendation | International Standard, the following abbreviations apply:

ODP	Open Distributed Processing
OSI	Open Systems Interconnection
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation Extra Information for Testing
RM-ODP	Reference Model of Open Distributed Processing
TP	Transaction Processing

5 Categorization of concepts

The modelling concepts defined in this Recommendation | International Standard are categorized as follows:

- a) *Basic interpretation concepts:* Concepts for the interpretation of the modelling constructs of any ODP modelling language. These concepts are described in clause 6.
- b) *Basic linguistic concepts:* Concepts related to languages; the grammar of any language for the ODP Architecture must be described in terms of these concepts. These concepts are described in clause 7.
- c) *Basic modelling concepts:* Concepts for building the ODP Architecture; the modelling constructs of any language must be based on these concepts. These concepts are described in clause 8.
- d) *Specification concepts:* Concepts related to the requirements of the chosen specification languages used in ODP. These concepts are not intrinsic to distribution and distributed systems, but they are requirements to be considered in these specification languages. These concepts are described in clause 9.