

Implementation of
ISO/IEC 10026-1:1992

Information technology — Open Systems Interconnection — Distributed Transaction Processing —

Part 1: OSI TP Model

Committees responsible for this British Standard

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- AEA Technology
- British Computer Society
- British Telecommunications plc
- CCTA (the Government Centre for Information Systems)
- Department of Trade and Industry (IT Standards Unit) (Itl6a)
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National foreword

This British Standard reproduces verbatim ISO/IEC 10026-1:1992 and implements it as the UK national standard.

This British Standard is published under the direction of the Information Systems Technology Standards Policy Committee whose Technical Committee IST/21 has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international committee any enquiries on interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ISO/IEC title page, pages ii to iv, pages 1 to 26 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.

INTERNATIONAL
STANDARD

ISO/IEC
10026-1

First edition
1992-12-15

**Information technology — Open Systems
Interconnection — Distributed Transaction
Processing —**

Part 1:
OSI TP Model

*Technologies de l'information — Interconnexion de systèmes ouverts
(OSI) — Traitement transactionnel réparti —
Partie 1: Modèle OSI TP*



Reference number
ISO/IEC 10026-1:1992(E)

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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. 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 10026-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

ISO/IEC 10026 consists of the following parts, under the general title *Information technology — Open Systems Interconnection — Distributed Transaction Processing*:

- *Part 1: OSI TP Model;*
- *Part 2: OSI TP Service;*
- *Part 3: Protocol specification;*
- *Part 4: Protocol implementation conformance statement (PICS) proforma;*
- *Part 5: Application context proforma;*
- *Part 6: Unstructured data transfer.*

Annex A forms an integral part of this part of ISO/IEC 10026. Annex B and Annex C are for information only.

Introduction

ISO/IEC 10026 is one of a set of standards produced to facilitate the interconnection of computer systems. It is related to other International Standards in the set as defined by the Reference Model for Open Systems Interconnection (ISO 7498). The Reference Model subdivides the area of standardization for interconnection into a series of layers of specification, each of manageable size.

The aim of Open Systems Interconnection is to allow, with a minimum of technical agreement outside the interconnection standards, the interconnection of computer systems

- a) from different manufacturers;
- b) under different management;
- c) of different levels of complexity; and,
- d) of different technologies.

ISO/IEC 10026 defines an OSI TP Model, an OSI TP Service and specifies an OSI TP Protocol available within the Application Layer of the OSI Reference Model.

The OSI TP Service is an Application Layer service. It is concerned with identifiable information which can be related as transactions, which may involve two or more open systems.

ISO/IEC 10026 provides sufficient facilities to support transaction processing, and establishes a framework for coordination across multiple OSI TP resources in separate open systems.

ISO/IEC 10026 does not specify the interface to local resources nor does it specify an application programming interface within the local system. However, future enhancement of the standard may deal with these issues.

1 Scope

This part of ISO/IEC 10026

- a) provides a general introduction to the concepts and mechanisms defined in ISO/IEC 10026;
- b) defines a model of transaction processing;
- c) defines the requirements to be met by the OSI TP Service; and
- d) takes into consideration the need to coexist with other Application Service Elements, e.g RDA (Remote Database Access), ROSE (Remote Operations Service Element), and non-ROSE based applications.

This part of ISO/IEC 10026 makes sufficient provisions to allow the specification of transaction-mode communications services and protocols that meet the properties of atomicity, consistency, isolation, and durability (the ACID properties), as defined in ISO/IEC 9804.

This part of ISO/IEC 10026 does not specify individual implementations or products, nor does it constrain the implementation of entities or interfaces within a computer system.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 10026. 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 ISO/IEC 10026 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7498:1984, *Information processing systems — Open Systems Interconnection — Basic Reference Model*.

ISO 7498-2:1989, *Information processing systems — Open Systems Interconnection — Basic Reference Model — Part 2: Security architecture*.

ISO 7498-3:1989, *Information processing systems — Open Systems Interconnection — Basic Reference Model — Part 3: Naming and addressing*.

ISO 8326:1987, *Information processing systems — Open Systems Interconnection — Basic connection oriented session service definition*.

ISO 8326/Amd 4:—, *Information technology — Open Systems Interconnection — Basic connection oriented session service definition. Amendment 4: Additional synchronization functionality*¹⁾.

ISO/TR 8509:1987, *Information processing systems — Open Systems Interconnection — Service conventions*.

ISO 8649:1988, *Information processing systems — Open Systems Interconnection — Service definition for the Association Control Service Element*.

ISO 8650:1988, *Information processing systems — Open Systems Interconnection — Protocol specification for the Association Control Service Element*.

¹⁾ To be published.

ISO 8822:1988, *Information processing systems — Open Systems Interconnection — Connection oriented presentation service definition*.

ISO 8822/Amd 5:—, *Information technology — Open Systems Interconnection — Connection oriented presentation service definition. Amendment 5: Additional session synchronization functionality to the presentation service user²⁾*.

ISO/IEC 8824:1990, *Information technology — Open Systems Interconnection — Specification of Abstract Syntax Notation One (ASN.1)*.

ISO/IEC 8825:1990, *Information technology — Open Systems Interconnection — Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)*.

ISO/IEC 9072-1:1989, *Information processing systems — Text communication — Remote Operations — Part 1: Model, notation, and service definition*.

ISO/IEC 9072-2:1989, *Information processing systems — Text communication — Remote Operations — Part 2: Protocol specification*.

ISO/IEC 9545:1989, *Information technology — Open Systems Interconnection — Application Layer structure*.

ISO/IEC 9579-1:—, *Information technology — Open Systems Interconnection — Remote database access — Part 1: Generic model, service, and protocol²⁾*.

ISO/IEC 9579-2:—, *Information technology — Open Systems Interconnection — Remote database access — Part 2: SQL Specialization²⁾*.

ISO/IEC 9594-2:1990, *Information technology — Open Systems Interconnection — The Directory — Part 2: Models*.

ISO/IEC 9594-6:1990, *Information technology — Open Systems Interconnection — The Directory — Part 6: Selected attribute types*.

ISO/IEC 9646-1:1991, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 1: General concepts*.

ISO/IEC 9804:1990, *Information technology — Open Systems Interconnection — Service definition for the Commitment, Concurrency and Recovery service element*.

ISO/IEC 9804/Amd 2:—, *Information technology — Open Systems Interconnection — Service definition for the Commitment, Concurrency and Recovery service element — Amendment 2: Session mapping changes²⁾*.

ISO/IEC 9805:1990, *Information technology — Open Systems Interconnection — Protocol specification for the Commitment, Concurrency and Recovery service element*.

ISO/IEC 9805/Amd 2:—, *Information technology — Open Systems Interconnection — Protocol specification for the Commitment, Concurrency and Recovery service element — Amendment 2: Session mapping changes²⁾*.

3 Definitions

For the purposes of ISO/IEC 10026, the following definitions apply:

3.1 Terms defined in other International Standards

3.1.1 ISO/IEC 10026 makes use of the following terms defined in ISO 7498:

- a) application-entity;
- b) application-process;
- c) application-protocol-data-unit;
- d) concatenation;
- e) open system;
- f) presentation-service;
- g) presentation-service-access-point;
- h) presentation-service-data-unit;
- i) real open system; and
- j) separation.

3.1.2 ISO/IEC 10026 makes use of the following terms defined in ISO 7498-2:

- a) access control;
- b) audit;
- c) authentication;
- d) confidentiality;
- e) integrity; and
- f) non-repudiation.

3.1.3 ISO/IEC 10026 makes use of the following terms defined in ISO 7498-3:

- a) application-process-invocation-identifier;
- b) application-process-title;

²⁾ To be published.

- c) application-entity-invocation-identifier;
- d) application-entity-qualifier; and
- e) application-entity-title.

3.1.4 ISO/IEC 10026 makes use of the following term defined in ISO 8326:

quality-of-service.

3.1.5 ISO/IEC 10026 makes use of the following terms defined in ISO/TR 8509:

- a) request;
- b) indication;
- c) response;
- d) confirm;
- e) service primitive; primitive;
- f) service-provider; and
- g) service-user.

3.1.6 ISO/IEC 10026 makes use of the following terms defined in ISO/IEC 9545:

- a) application-association; association;
- b) application-context;
- c) application-context-name;
- d) application-entity-invocation;
- e) application-process-invocation;
- f) application-service-element;
- g) association control service element;
- h) multiple association control function;
- i) single association control function; and
- j) single association object.

3.1.7 ISO/IEC 10026 makes use of the following terms defined in ISO/IEC 9594-2:

- a) Directory Information Tree;
- b) Directory entry; entry;
- c) distinguished name;
- d) object class; and
- e) relative distinguished name.

3.1.8 ISO/IEC 10026 makes use of the following terms defined in ISO/IEC 9804:

- a) atomic action data;
- b) atomicity;
- c) bound data;
- d) consistency;
- e) durability;
- f) final state;
- g) heuristic decision;
- h) initial state; and
- i) isolation.

3.2 Terms defined in ISO/IEC 10026

3.2.1

application-supported distributed transaction

a transaction where the user of the OSI TP Service is responsible for the maintenance of the ACID properties

3.2.2

chained sequence

a sequence of related contiguous (provider-supported) transaction branches, on the same dialogue, that are aimed at achieving a common goal

3.2.3

Channel Protocol Machine; CPM

the part of an AEI involved in OSI TP that establishes and terminates TP channels

3.2.4

commitment coordinator

a TPSU invocation (TPSUI) involved in a distributed transaction together with its Transaction Processing Protocol Machine (TPPM) that arbitrates the final outcome of the transaction

3.2.5

control

the permission, on a particular dialogue, for a TPSUI to communicate with its partner

3.2.6

coordination level

an agreement between two TPSUIs on what mechanism will be used to guarantee the four properties of a transaction

3.2.7

dialogue

the relationship between two TPSUIs that communicate with each other

3.2.8

dialogue recovery

action taken after a failure to resume use of the dialogue

3.2.9

distributed transaction

a transaction, parts of which may be carried out in more than one open system

3.2.10

heuristic-hazard

the condition that arises when, as a result of communication failure with a subordinate, the bound data of the subordinate's subtree is in an unknown state

3.2.11

heuristic-mix

the condition that arises when, as a result of one or more heuristic decisions having been taken, the bound data of the transaction is in an inconsistent state

3.2.12

local resource

a resource that is resident on the same real open system as the requestor of the resource, or a resource that is managed by an entity residing in the same real open system as the requestor of the resource