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Information technology — Open Systems Interconnection — Distributed Transaction Processing —

Part 3:
Protocol specification

Technologies de l'information — Interconnexion de systèmes ouverts (OSI) — Traitement transactionnel réparti —

Partie 3: Spécification du protocole

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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 10026-3 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*

Annexes A and B form an integral part of this part of ISO/IEC 10026. Annexes C, D, E, F, G and H are for information only.

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Introduction

ISO/IEC 10026, Distributed Transaction Processing (OSI TP), 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 (OSI) 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 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.

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Information technology — Open Systems Interconnection — Distributed Transaction Processing — Part 3: Protocol specification

1 Scope

This part of ISO/IEC 10026 provides

a) a statement (clauses 6 to 11) of the nature of the automaton giving the necessary behaviour of each of the participating entities which are providing the OSI TP Service, covering

1) the actions to be taken on receiving request and response primitives issued by a TP Service user invocation;

2) the actions to be taken on receiving indication and confirm primitives issued by the presentation service-provider;

3) the actions to be taken as a result of certain events within the local system;

4) the actions to be taken as a result of interactions with other ASEs;

b) the definition (clause 12) of the abstract syntax required to convey the TP protocol control information;

c) the conformance requirements to be met by implementations of this protocol (clause 13).

The scope of this part of ISO/IEC 10026 is limited to the interconnection of systems; it does not specify or restrict the implementation of possible 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 indicated 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 : 1987/Amd 4: —[1], *Information technology - Open Systems Interconnection - Basic connection oriented session service definition - Amendment 4: Additional synchronization functionality.*

ISO 8327 : 1987/Amd 3: —[1], *Information processing systems - Open Systems Interconnection - Basic connection oriented session protocol specification. - Amendment 3:*

1) To be published.

Additional synchronization functionality.

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3 Definitions

For the purposes of this part of ISO/IEC 10026, the definitions given in ISO/IEC 10026-1 (TP Model) and ISO/IEC 10026-2 (TP Service), in addition to those given in 7.3 of this part of ISO/IEC 10026, apply.

Definitions of terms specific to the OSI TP protocol specification are contained in 7.3.

4 Abbreviations

Abbreviations used in the OSI TP protocol specifications are defined in ISO/IEC 10026-1 (OSI TP model), except for the following, which are used in some tables:

cnf confirm primitive

ind indication primitive

req request primitive

rsp response primitive

and for the following, which are used as prefixes to auxiliary facilities services:

1) To be published.

AF Auxiliary Facility

CAF Channel Auxiliary Facility

SAF SACF Auxiliary Facility

5 Conventions

ISO/IEC 10026-2 defines services for Distributed Transaction Processing guided by the descriptive conventions defined in ISO/TR 8509.

However, the terms "request" and "indication" are sometimes used in the following ways:

a) a single request may result in multiple indications (an example is that a single TP-COMMIT request can result in TP-PREPARE indications to each direct subordinate TPSUI);

b) several requests may result in a single indication (an example is that a single TP-COMMIT-COMPLETE indication may be issued to a superior TPSUI only after TP-DONE requests have been issued by the TPSUI and all subordinate TPSUIs in the transaction tree);

c) the convention that a request primitive results in an indication primitive of the same name is not always followed (for example, a TP-COMMIT request will cause a TP-PREPARE indication to be issued).

For a given primitive or APDU, the presence of each parameter or field is described by one of the following values:

blank: not applicable
M: presence is mandatory
U: presence is a user option
O: presence is a provider option
C: presence is conditional

In addition, the notation (=) indicates that a parameter or field value is semantically equal to the value of the parameter or field of the preceding primitive or APDU in the table. This notation is in some instances combined with another value above, e.g. "(=)/M", and signifies that in some cases the primitive follows as a result of a preceding primitive or APDU (that is, "(=)" applies) and in other cases (when "M" applies), either (i) there is no preceding primitive or APDU, or (ii) the value from the preceding primitive or APDU can be changed.

6 Model of the PM

6.1 Overview

This clause provides an overview of those aspects of the TPPM which are specific to this part of ISO/IEC 10026. These include association usage and management, the details of dialogue establishment and channel management, the use of the Session synchronize-minor token, concatenation, and embedding.

6.1.1 Principles of association usage

An association is used by a TPPM to support either a

— TP dialogue; or

— TP Channel.

An association may be established at any time, according to a local decision. The setting up of an association may be done in parallel with the actions of the PM. An association that has been established and is not currently being used is considered to be in a pool of free associations.

On receipt of a dialogue request, the PM needs to be assigned an association to support this dialogue. Any association that is assigned must have attributes compatible with the dialogue it is to be used for, as described in 8.5.2 (dialogues) and 8.5.3 (channels).

An association may be assigned to the PM from the pool of free associations, or attempts may be made to establish a new association for use with this dialogue or channel. If, as a local decision, it is decided that a compatible association cannot be assigned, the begin dialogue request will be rejected.

Associations may be released at any time they are not in use by the TPPM. The point at which an association becomes unused, and therefore may be released, is defined in the SACF procedures in clause 10.

On the establishment of an association, one AEI is assigned to be the "contention-winner" and the other as the "contention-loser". The assignment of contention-winner and contention-loser remains for the duration of the association. An AEI may be the contention-winner on some associations and contention-loser on others.

The direction from the contention-winner to the contention-loser is the preferred direction of dialogue establishment because the contention-winner has the right of use of the association. The contention-winner may grant to the contention-loser the use of the association for the purpose of establishment of a dialogue, if it is not using or has not reserved this association. The contention-winner may also deny the use of the association by the contention-loser for the purpose of dialogue establishment.

The contention-loser may formally request the rights of the contention-winner temporarily in order to attempt establishment of a single dialogue. This is done using the bid mechanism. The use of the bid mechanism is declared to be either optional or mandatory at association

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