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**DATA NETWORKS AND OPEN SYSTEM
COMMUNICATIONS**

OSI APPLICATIONS – TRANSACTION PROCESSING

**INFORMATION TECHNOLOGY –
OPEN SYSTEMS INTERCONNECTION –
DISTRIBUTED TRANSACTION PROCESSING:
PROTOCOL IMPLEMENTATION
CONFORMANCE STATEMENT (PICS)
PROFORMA**

ITU-T Recommendation X.863

(Previously “CCITT Recommendation”)

Foreword

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. Some 179 member countries, 84 telecom operating entities, 145 scientific and industrial organizations and 38 international organizations participate in ITU-T which is the body which sets world telecommunications standards (Recommendations).

The approval of Recommendations by the Members of ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, 1993). In addition, the World Telecommunication Standardization Conference (WTSC), which meets every four years, approves Recommendations submitted to it and establishes the study programme for the following period.

In some areas of information technology, which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC. The text of ITU-T Recommendation X.863 was approved on 1st of July 1994. The identical text is also published as ISO/IEC International Standard 10026-4.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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ITU-T X-SERIES RECOMMENDATIONS
DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS
 (February 1994)
ORGANIZATION OF X-SERIES RECOMMENDATIONS

Subject area	Recommendation series
PUBLIC DATA NETWORKS	
Services and facilities	X.1-X.19
Interfaces	X.20-X.49
Transmission, signalling and switching	X.50-X.89
Network aspects	X.90-X.149
Maintenance	X.150-X.179
Administrative arrangements	X.180-X.199
OPEN SYSTEMS INTERCONNECTION	
Model and notation	X.200-X.209
Service definitions	X.210-X.219
Connection-mode protocol specifications	X.220-X.229
Connectionless-mode protocol specifications	X.230-X.239
PICS proformas	X.240-X.259
Protocol identification	X.260-X.269
Security protocols	X.270-X.279
Layer managed objects	X.280-X.289
Conformance testing	X.290-X.299
INTERWORKING BETWEEN NETWORKS	
General	X.300-X.349
Mobile data transmission systems	X.350-X.369
Management	X.370-X.399
MESSAGE HANDLING SYSTEMS	X.400-X.499
DIRECTORY	X.500-X.599
OSI NETWORKING AND SYSTEM ASPECTS	
Networking	X.600-X.649
Naming, addressing and registration	X.650-X.679
Abstract Syntax Notation One (ASN.1)	X.680-X.699
OSI MANAGEMENT	X.700-X.799
SECURITY	X.800-X.849
OSI APPLICATIONS	
Commitment, concurrency and recovery	X.850-X.859
Transaction processing	X.860-X.879
Remote operations	X.880-X.899
OPEN DISTRIBUTED PROCESSING	X.900-X.999

CONTENTS

	<i>Page</i>
Summary	ii
Introduction	iii
1 Scope	1
2 Normative references	1
2.1 Identical Recommendations International Standards	1
2.2 Paired Recommendations International Standards equivalent in technical content	1
3 Definitions	2
3.1 Conformance testing definitions	2
3.2 TP Model definitions	2
3.3 TP PICS definitions	2
4 Abbreviations	2
5 Conformance	2
6 Description of the proforma	2
6.1 Identification of the PICS	3
6.2 Conformance claim	3
6.3 Support of functional units, limits and mechanisms	3
6.4 Support of TP APDUs	3
6.5 Multi-Layer dependencies	3
7 Notations defined for the proforma	3
7.1 PICS number column	3
7.2 Item column	3
7.3 Reference column	3
7.4 Status column	4
7.5 Support column	4
7.6 Cross reference column	4
7.7 VALUES column	4
7.8 Comment column	4
7.9 Column entries	5
8 PICS numbers	5
9 Completion of the PICS	5
Annex A – Protocol Implementation Conformance Statement (PICS) Proforma for OSI Distributed Transaction Processing	6
A.1 Identification	9
A.2 Claimed conformance to Recommendations Standards	10
A.3 Functional units, limits and protocol mechanisms	11
A.4 TP protocol – General	16
A.5 TP protocol – Support of the dialogue functional unit	16
A.6 TP protocol – Support of the shared control functional unit	21
A.7 TP protocol – Support of the polarized control functional unit	22
A.8 TP protocol – Support of the handshake functional unit	22
A.9 TP protocol – Support of the commit functional unit	24
A.10 TP protocol – Support of the recovery functional unit	26
A.11 Multi-layer dependencies	28
Annex B – Implementation capability detail	30

Summary

This Recommendation | International Standard describes the protocol implementation conformance statement for the OSI transaction processing protocol (see Recommendation X.862). The PICS present, in tabular form, the mandatory and optional elements of the TP protocol. The PICS are utilized to represent the choices and features of a particular implementation of OSI TP.

Introduction

This Recommendation | International Standard for OSI Distributed Transaction Processing (TP) is one of a set of Recommendations | International Standards produced to facilitate the interconnection of computer systems. It is related to other CCITT Recommendations | International Standards in the set as defined by the Reference Model for Open Systems Interconnection (ITU-T Rec. X.200 | ISO 7498-1). 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.

The Recommendations | International Standard for OSI TP define a TP Model, a TP Service and specify a TP communications Protocol available within the Application Layer of the OSI Reference Model. The TP Service is of the category defined in the Application Layer Structure standard. It is concerned with identifiable information which can be related as transactions, which may involve two or more open systems.

The Recommendations | International Standard for OSI TP defines a basic TP Service. It provides sufficient facilities to support transaction processing, and establishes a framework for coordination across multiple TP resources in separate Open Systems.

The Recommendations | International Standard for OSI TP does not specify the interface to local resources or access facilities that are provided within the local system. However detailed consideration of access to the local resources and their management may lead to some enhancement in a future revision of the Recommendations | International Standard.

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given OSI protocol. Such a statement is called a Protocol Implementation Conformance Statement (PICS).

The PICS Proforma, Annex A, has been designed to be a self contained section of this Recommendation | Part of ISO/IEC 10026 for use in testing and procurement.

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – DISTRIBUTED TRANSACTION PROCESSING: PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS) PROFORMA

1 Scope

This Recommendation | International Standard provides the PICS proforma for the Distributed Transaction Processing protocol as specified in ITU-T Rec. X.862 | ISO/IEC 10026-3 in compliance with the relevant requirements, and in accordance with the relevant guidance, given in CCITT Rec. X.291 | ISO/IEC 9646-2. Details of the use of this proforma is provided in this Recommendation | Part of ISO/IEC 10026. Implementors of implementations claiming conformance to ITU-T Rec. X.862 | ISO/IEC 10026-3 shall complete the proforma as part of the conformance requirements. The level of detail required in the proforma exceeds that of the protocol specification by requiring details to uniquely identify the implementation and the supplier.

NOTE – PICS are related to base standards and only base standards. PICS Proforma structure might be expanded and refined for other documents (e.g. ISPs) using the base standards (e.g. ISPICS Proforma).

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 editions of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of ITU maintains a list of currently valid ITU-T Recommendations.

References used in this TP PICS are defined in CCITT Rec. X.860 | ISO/IEC 10026-1 (TP Model), with the addition of those listed below:

2.1 Identical Recommendations | International Standards

- ITU-T Recommendation X.225¹⁾ | ISO/IEC 8327-1:....¹⁾, *Information technology – Open Systems Interconnection – Connection-oriented session protocol: Protocol specification.*
- ITU-T Recommendation X.226 (1994) | ISO/IEC 8823-1:1994, *Information technology – Open Systems Interconnection – Connection-oriented presentation protocol: Protocol specification.*

2.2 Paired Recommendations | International Standards equivalent in technical content

- CCITT Rec. X.290 (1992) | ISO/IEC 9646-1:1991, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts.*
- CCITT Rec. X.291 (1992) | ISO/IEC 9646-2:1991, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 2: Abstract test suite specification.*
- ITU-T Rec. X.862 (1993) | ISO/IEC 10026-3:1992, *Information technology – Open Systems Interconnection – Distributed transaction processing – Part 3: Protocol specification.*

¹⁾ Previously equivalent texts; to be republished as common text.

3 Definitions

For the purpose of this Recommendation | International Standard, the following definitions apply:

3.1 Conformance testing definitions

This Recommendation | International Standard uses the following terms defined in CCITT Rec. X.290 | ISO/IEC 9646-1:

- a) PICS Proforma;
- b) Protocol Implementation Conformance Statement (PICS).

3.2 TP Model definitions

Terms used in ITU-T Rec. X.863 | ISO/IEC 10026-4 are defined in CCITT Rec. X.860 | ISO/IEC 10026-1, except the following terms.

3.3 TP PICS definitions

For the purpose of this Recommendation | International Standard, the following terms apply:

3.3.1 sender: The node that generates and transmits a TP APDU or a parameter of a TP APDU.

3.3.2 receiver: The node that receives and interprets a TP APDU or a parameter of a TP APDU.

4 Abbreviations

Abbreviations used in Recommendation | International Standard are defined in CCITT Rec. X.860 | ISO/IEC 10026-1 and clause 7 of this Recommendation | International Standard.

Additionally, the following abbreviation used in Recommendation | International Standard is defined in CCITT Rec. X.290 | ISO/IEC 9646-1:

- PICS

The following abbreviations are used in this Recommendation | International Standard:

FU	Functional Unit
ISP	International Standardized Profile
ISPICS	International Standardized Profile Implementation Conformance Statement
Sdr	Sender
Rcv	Receiver

5 Conformance

A conforming PICS shall be technically equivalent to the ITU-T | ISO/IEC published PICS Proforma (see Annex A) and shall preserve the numbering and ordering of items in the ITU-T | ISO/IEC PICS Proforma.

A PICS which conforms to ITU-T Rec. X.863 | ISO/IEC 10026-4 shall:

- a) describe an implementation which conforms to ITU-T Rec. X.862 | ISO/IEC 10026-3;
- b) be a conforming PICS proforma, which has been completed in accordance with the instructions for completion given in clauses 7 and 9; and
- c) include the information necessary to uniquely identify both the supplier and the implementation.

6 Description of the proforma

The Proforma defined in Annex A is divided into the following sections:

- a) Identification of the PICS;
- b) Conformance Claim;

- c) Support of FUs, Limits and Mechanisms;
- d) Support of TP APDUs; and
- e) Multi-layer dependencies.

6.1 Identification of the PICS

Subclause A.1 contains:

- the Date of Statement for the PICS;
- the Supplier and Implementation details which provide a number of items of information which allow a unique identification of an implementation and the supplier of the PICS.

6.2 Conformance claim

Subclause A.2 includes information on which protocol version numbers, amendments and technical corrigenda have been included in the implementation.

6.3 Support of functional units, limits and mechanisms

Subclause A.3 identifies the Functional Units supported by the implementation depending on the possible modes of operation. It also includes a statement of which roles and mechanisms have been implemented.

NOTE – The proforma defined in Annex B may be used for any practical limits the implementation may have, such as any limits on the concurrent number of dialogues and transaction branches that can be supported, and any APDU size limits.

6.4 Support of TP APDUs

Subclauses A.4 to A.10 comprise the major portion of the PICS, this part establishes which fields of which PDUs are implemented. It requires a statement of the values supported and a reference to further detail for many of the fields.

6.5 Multi-Layer dependencies

Subclause A.11 includes identification of the support of OSI standards used by, or implied by, the OSI TP protocol.

7 Notations defined for the proforma

In order to reduce the size of the tables in the PICS proforma, notations have been introduced. These have allowed the use of multi-column layout where the columns are PICS No., Item, Reference (to relevant clause of ISO/IEC 10026-3), Status, Support, Cross Reference (to another clause of the proforma – if any), VALUES, and Comment. Some of these columns are sub-divided to indicate separately the status or support as Sender (“Sdr”) or Receiver (“Rcv”). The definition of each of these follows.

7.1 PICS number column

This column contains a serial number that increases monotonically down the table to enable reference to each row of the table. (Refer to clause 8).

7.2 Item column

This column contains an identification of the item addressed by this row in the table; examples of items include TP APDUs, fields or sub-fields of TP APDUs or roles.

7.3 Reference column

This column contains a reference to a clause in ITU-T Rec. X.862 | ISO/IEC 10026-3 that specifies the item addressed in this row of the table.

When ITU-T Rec. X.862 | ISO/IEC 10026-3 simply refers to CCITT Rec. X.861 | ISO/IEC 10026-2 for the definition of fields of TP APDUs, the reference to the relevant clause of CCITT Rec. X.861 | ISO/IEC 10026-2 is also added (between parentheses). This is not intended to mean that conformance to the service definition is required, but rather to give some extra tutorial information.

7.4 Status column

Status – Defined in ITU-T Rec. X.862 | ISO/IEC 10026-3. This column indicates the level of support required for conformance to ITU-T Rec. X.862 | ISO/IEC 10026-3. These are detailed below:

- ‘m’ Mandatory support is required for conformance to ITU-T Rec. X.862 | ISO/IEC 10026-3.
- ‘d’ Mandatory support is required for conformance to ITU-T Rec. X.862 | ISO/IEC 10026-3. A default value is defined in the ASN.1 specification and for this special value a sender may omit this parameter when this value is intended. A receiver shall interpret the omission of an explicit value for this parameter as implying this default value.
- ‘o’ Optional support is permitted for conformance to ITU-T Rec. X.862 | ISO/IEC 10026-3. If implemented, it must conform to the specifications and restrictions contained in ITU-T Rec. X.862 | ISO/IEC 10026-3. These restrictions may affect the optionality of other parameters.
- ‘o.n’ The notation o.<n> signifies that at least one out of the n group shall be implemented (where <n> is a positive integer).
- ‘cn’ Conditional support as indicated by the predicate expression for cn (where <n> is a positive integer).
- ‘n/a’ Indicates that the item is not applicable.

When appropriate, the column is sub-divided into Sender (Sdr) and Receiver (Rcv) roles.

7.5 Support column

The “Support” column shall be completed by the supplier or implementor to indicate the level of implementation of each item in the role of Sender and Receiver. Where a column is preprinted with n/a, representing a non applicable entry, no entry shall be inserted at that position. Elsewhere entries shall be as defined in 7.9

7.6 Cross reference column

This column contains a cross reference to another clause in this document where the item addressed by this row of this table is addressed in more detail. If there is no such clause, then this is indicated:

- for tables related to TP APDUs, or details of TP APDUs, by the entry “n/a”;
- for other tables by the absence of the column.

7.7 VALUES column

This column is sub-divided into “Status”, which indicates any limitations on the allowed values specified in ITU-T Rec. X.862 | ISO/IEC 10026-3, and “Support”, which shall be completed by the supplier or the implementor to indicate any restriction on the values supported by the implementation of each item in the role of Sender or Receiver. Where this column is preprinted with n/a, representing a non applicable entry, no entry shall be inserted at that position. Elsewhere entries shall be as defined in 7.9.

The following notation is used to express the allowed or implemented values of parameters in the VALUES column:

- For BITSTRING Types – For example 01100 where the left most bit is sent and received first, 0 means that the bit in that position shall be set to 0, and 1 that it shall be set to 1. An x means that the bit in that position may be set to 0 or 1. “Any” means any valid value of that Type. The number of bits shown is the number of significant bits.
- For ENUMERATED Types – The integer representation of the values of this particular enumerated type is utilised. A number of values may be listed separated by commas (e.g. 1,2,5,8) or a range of values indicated by giving the lower and upper limits of the range separated by a dash (e.g. 1-4 is the same as 1,2,3,4). “Any” means any valid value of that Type.

7.8 Comment column

This column is left blank for the implentor to add a comment on the responses given, or other relevant information. If the implementor has no comment to add then the entry should be left blank.

7.9 Column entries

The PICS proforma has been designed such that the only entries required in the “Sender” and “Receiver” columns are:

- “Y” Yes, the feature has been implemented. If “Y” is entered in a PICS table, the value of that entry when referenced in Boolean expressions is “TRUE”.
- “N” No, the feature has not been implemented. If “N” is entered in a PICS table, the value of that entry when referenced in Boolean expressions is “FALSE”.
- “Ig” Ignored, the occurrence of the item is not treated as a protocol error, but is ignored rather than processed. If “Ig” is entered in a PICS table, the value of that entry when referenced in Boolean expressions is “FALSE”.
- “Err” Error, the occurrence of this item is treated as a protocol error. If “Err” is entered in a PICS table, the value of that entry when referenced in Boolean expressions is “FALSE”.

“Ig” and “Err” shall only be used in the “Receiver” columns. They have the same static conformance semantic as “N”. “N” shall never be used in the “Receiver” columns.

If an item is marked as “m” or “d” in the status column then only “Y” may be checked in the support column for the implementation to be conformant.

The “VALUES” column requires the specification of the range of values implemented for the item it is alongside, for each role, where relevant. The range of values implemented may be specified in terms of the values of the ASN.1 datatype, or in terms of the encoded length.

The headings of the Support column, or the Value/Support sub-column, indicate which of the above answers generally apply to the column. When a cell has been pre-printed with one of these entries followed by “[]”, the [] box should be checked if that answer applies. If no pre-printed answer applies, a separate response should be supplied in the white space of the cell. Such an alternate response is an indication of non-conformance.

8 PICS numbers

Each line, within a clause of the PICS proforma, which requires implementation detail to be entered, is numbered in the left hand box of the line. This numbering is included as a means of uniquely identifying all possible implementation detail within the PICS proforma. The need for such unique referencing has been identified by the testing bodies.

All responses shall be referenced by specifying the following sequence:

- a) a reference to the smallest subclause enclosing the relevant item;
- b) a solidus character, “/”;
- c) the reference number of the row in which the response appears;
- d) if, and only if, more than one response occurs in the row identified by the reference number, then each possible entry (where the PICS has to be completed) is implicitly labelled a, b, c, etc., from left to right, and this letter is appended to the sequence.

9 Completion of the PICS

The implementor shall complete all entries in the columns labelled “Support”. In addition, other specifically identified information shall be provided by the implementor where requested.

Cells to be completed are left blank in the PICS proforma. All cells containing the symbol “n/a” shall be left as in the proforma.

No changes shall be made to the proforma except the completion as required. Recognising that the level of detail required may, in some instances, exceed the space available for responses, additional responses may be given by the addition of appendices to the PICS.