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Information technology — Open Systems Interconnection — Protocol specification for the Association Control Service Element: Protocol Implementation Conformance Statement (PICS) proforma

*Technologies de l'information — Interconnexion de systèmes ouverts
(OSI) — Spécification du protocole pour l'élément de service de contrôle
d'association: Proforme d'établissement de conformité pour la mise en
œuvre du protocole (PICS)*



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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 8650-2 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.247.

ISO/IEC 8650 consists of the following parts, under the general title *Information technology — Open Systems Interconnection — Protocol specification for the Association Control Service Element*:

- *Part 1: Protocol specification*
- *Part 2: Protocol Implementation Conformance Statement (PICS) proforma*

Annex A forms an integral part of this part of ISO/IEC 8650. Annex B is for information only.

Introduction

This Recommendation | International Standard is one of a set of Recommendations | International Standards produced to facilitate the interconnection of information processing systems. It is related to other Recommendations and International Standards in the set as defined by the Reference Model for Open Systems Interconnection (ITU-T Rec. X.200 | ISO/IEC 7498-1). The Reference Model subdivides the area of standardization for interconnection into a series of layers of specification, each of manageable size.

The goal of Open Systems Interconnection is to allow, with a minimum of technical agreement outside the interconnection standards, the interconnection of information processing systems:

- from different manufacturers;
- under different managements;
- of different levels of complexity; and
- of different technologies.

ITU-T Rec. X.227 | ISO/IEC 8650-1 specifies the connection-oriented mode protocol for the application-service-element for application-association control: the Association Control Service Element (ACSE). The ACSE connection-oriented mode provides services for establishing and releasing application-associations. The ACSE protocol also includes an optional functional unit for exchanging information to support authentication during association establishment. The ACSE services apply to a wide range of application-process communication requirements.

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

This Recommendation | International Standard includes the PICS proforma for the connection-oriented ACSE protocol as defined in ITU-T Rec. X.227 | ISO/IEC 8650-1.

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

**INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION –
 PROTOCOL SPECIFICATION FOR THE ASSOCIATION CONTROL
 SERVICE ELEMENT: PROTOCOL IMPLEMENTATION
 CONFORMANCE STATEMENT (PICS) PROFORMA**

1 Scope

This Recommendation | International Standard provides the Protocol Implementation Conformance Statement (PICS) proforma for the connection-oriented ACSE protocol specified in ITU-T Rec. X.227 | ISO/IEC 8650-1. This PICS proforma is in compliance with the relevant requirements, and in accordance with the relevant guidance given in ITU-T Rec. X.296 | ISO/IEC 9646-7. Detail of the use of this proforma is provided in this Recommendation | International Standard.

The supplier of an implementation which is claimed to conform to ITU-T Rec. X.227 | ISO/IEC 8650-1 is required to complete a copy of the PICS proforma provided in Annex A, and is required to provide the information necessary to identify both the supplier and the implementation.

2 Normative references

The following Recommendations | 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 the 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 indicated below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunications Standardization Bureau of the ITU maintains a list of valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

- ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The basic model.*
- ITU-T Recommendation X.216 (1994) | ISO/IEC 8822:1994, *Information technology – Open Systems Interconnection – Presentation service definition.*
- ITU-T Recommendation X.217 (1995) | ISO/IEC 8649:—¹⁾, *Information technology – Open Systems Interconnection – Service definition for the Association Control Service Element.*
- ITU-T Recommendation X.225 (1994) | ISO/IEC 8327-1:—²⁾, *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.*
- ITU-T Recommendation X.227 (1995) | ISO/IEC 8650-1:1995, *Information technology – Open Systems Interconnection – Connection-oriented protocol for the Association Control Service Element: Protocol specification.*

1) Currently under revision.

2) To be published.

2.2 Paired Recommendations | International Standards equivalent in technical contents

- ITU-T Recommendation X.290 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications - General concepts*.
ISO/IEC 9646-1:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts*.
- ITU-T Recommendation X.296 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications - Implementation conformance statements*.
ISO/IEC 9646-7:1995, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation conformance statements*.

2.3 Additional references

- CCITT Recommendation X.410 (1984): *Message handling systems: Remote operations and reliable transfer server*.

3 Definitions

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

3.1 Terms defined in ITU-T Rec. X.227 | ISO/IEC 8650-1

3.2 The following terms defined in ITU-T Rec. X.290 | ISO/IEC 9646-1:

- a) Implementation Conformance Statement proforma;
- b) Implementation Conformance Statement;
- c) Protocol Implementation Conformance Statement (PICS);
- d) PICS proforma.

3.3 Additional terms

- a) Requestor: the PPM that initiates a particular action;
- b) Acceptor: the PPM that accepts a particular action.

4 Abbreviations

For the purposes of this Recommendation, the following abbreviations apply:

ACSE	Association Control Service Element
APDU	Application Protocol Data Unit
ICS	Implementation Conformance Statement
PICS	Protocol Implementation Conformance Statement
PDU	Protocol Data Unit

5 Conformance

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

A PICS which conforms to this Recommendation | International Standard shall:

- a) describe an implementation which conforms to ITU-T Rec. X.227 | ISO/IEC 8650-1;
- b) be a conforming PICS proforma, which has been completed in accordance with the instruction for completion given in A.2;
- c) include the information necessary to uniquely identify both the supplier and the implementation.

Annex A¹⁾

Protocol implementation conformance statement (PICS) proforma for the ACSE protocol

(This annex forms an integral part of this Recommendation | International Standard)

A.1 Identification of PICS proforma corrigenda

The supplier of the PICS proforma shall identify any corrigenda (i.e. Technical Corrigenda or equivalent) to the published proforma that have been applied. Suppliers of the proforma should modify the proforma, or attach relevant additional pages in order to apply the corrigenda, and then record the application of the corrigenda in Table A.1.

Identification of corrigenda applied to this PICS proforma	ITU-T Rec. X.247 (1994) ISO/IEC 8650-2:1995 Corr: Corr: Corr:
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A.2 Instructions

A.2.1 Purpose and structure of the proforma

The purpose of this PICS proforma is to provide suppliers of implementations of ITU-T Rec. X.227 | ISO/IEC 8650-1 with a consistent means of stating which capabilities have been implemented.

The proforma is in the form of a questionnaire and consists of a set of items. An item is provided for each capability for which an implementation choice is allowed. Items are also provided for major mandatory capabilities for which no implementation choice is allowed. Each item includes an item number, an item description, a status value specifying the support requirement, and room for a support answer to be provided by the supplier.

This subclause provides general information and instructions for completion of the proforma.

Subclause A.3 is for identification of the implementation.

Subclause A.4 contains the means of specifying, at a high level, the protocol and corrigenda that have been implemented.

Subclause A.5 contains the global statement of conformance.

Subclause A.6 onwards contain tables in which the supplier specifies details of the implementation options chosen.

A.2.2 Symbols, terms and abbreviations

A.2.2.1 Introduction

Notations have been introduced in order to reduce the size of tables in the PICS proforma. These have allowed the use of multi-column layout where the columns are headed 'Status', and 'Support'. The definition of each are given below.

Additionally, the following definitions apply:

(PICS) item: A row in a PICS proforma table.

1) Copyright release for PICS proformas
Users of this Recommendation | International Standard may freely reproduce the PICS proforma in this annex so that it can be used for its intended purpose and may further publish the completed PICS.

(PICS) question: The question to be answered in the intersection of a PICS item and either a support column (i.e. “Is this item supported in the context applying to this table and column”) or supported values column (i.e. “What values are supported for this item in the context applying to this table and column”) in a PICS proforma table.

status (value): An allowed entry in the status column for an item in a PICS proforma table.

(support) answer: An allowed entry in the support or supported values columns for an item in a PICS, in answer to a PICS question.

A.2.2.2 Prerequisite notation

If a predicate applies to a whole ICS proforma table, a prerequisite line may be specified in front of the table to which it applies. A prerequisite line takes the form:

Prerequisite: <predicate>

The meaning of such a line is that if <predicate> is True, then the table applies, else it is not-applicable.

A.2.2.3 Item numbering

Each line within the PICS proforma which requires implementation detail to be entered is given an item number in the first column. The item number column provides a means of uniquely referencing each possible answer within the PICS proforma. Such referencing is necessary for specifying predicates, conditional expressions, test suite parameters, and test suite selection expressions.

The means of referencing individual answers is to specify the following sequence:

- a) if, and only if, the reference is being made from another Specification, then start with an unambiguous identifier for the relevant ICS proforma specification, enclosed in parentheses – this identifier is stated in the PICS proforma specification and is updated whenever the PICS proforma is updated – it is recommended that this identifier should be the relevant Specification number and year of publication, as is used in a Normative References clause, and this is the default for such identifiers;
- b) the number of the relevant table or, if the tables are not numbered, of the smallest subclause enclosing the relevant table;
- c) a solidus character, “/”;
- d) the item number or mnemonic reference to the item, to identify the row in which the answer appears;
- e) if, and only if, more than one question occurs in the row identified by the item number or mnemonic reference, then each possible answer is implicitly labelled a, b, c, etc., from left to right, and this letter is appended to the sequence, prefixed by a solidus character (“/”) if a mnemonic reference is used.

If mnemonic references are specified and each uniquely identify an item in the PICS proforma, then entries b) and c) in the above sequence may be omitted.

A.2.2.4 Status column

‘Status’ as defined in ITU-T Rec. X.227 | ISO/IEC 8650-1. This column indicates the level of support required for conformance to ITU-T Rec. X.227 | ISO/IEC 8650-1. The values are as follows:

- ‘m’ Mandatory support is required.
- ‘o’ Optional support is permitted for conformance to ITU-T Rec. X.227 | ISO/IEC 8650-1. If implemented it must conform to the specifications and restrictions contained in ITU-T Rec. X.227 | ISO/IEC 8650-1. These restrictions may affect the optionality of other items.
- ‘o.n’ The item is optional, but the optionality is qualified (where n is the number which identifies the qualification which is applicable). The definitions for the qualified optional statements used are written under the tables in which first appear, and are indexed in Annex B.

- 'cn' The item is conditional (where n is the number which identifies the condition which is applicable). The definitions for the conditional statements used are written under the tables in which they first appear, and are indexed in Annex B.
- 'n/a' The item is not applicable.

A.2.2.5 **Support column**

The 'Support' column shall be completed by the supplier or implementor to indicate the level of implementation of each feature. The proforma has been designed such that the only entries required in the 'Support' column are:

- 'Y' yes, the feature has been implemented;
- 'N' no, the feature has not been implemented;
- '-' no answer required – it is unnecessary to answer the question with a yes or a no because the question has a status value of not-applicable.

Two additional support answers are defined for use in the receiver support column when the feature is not supported

- Ig or Ignored – The item (e.g. PDU or parameter) is ignored (i.e. processed syntactically but not semantically).
- Err or Error – The item (e.g. PDU or parameter) is treated as a protocol error.

These answers may only be used when the item is optional (either explicitly, or upon evaluation of a condition) and it is necessary to specify the action that the implementation takes upon receipt of the item.

A.2.3 **Instructions for completion**

The supplier shall complete all entries in the column marked 'Support'. In certain clauses of the PICS proforma further guidance for completion may be necessary. Such guidance shall supplement the guidance given in this clause and shall have a scope restricted to the clause in which it appears. In addition, other specifically identified information shall be provided by the implementor where requested. No changes shall be made to the proforma except the completion as required. Recognizing that the level of detail required may, in some instances, exceed the space available for responses a number of responses specifically allow for the addition of appendices to the PICS.

A.3 **Identification of the implementation**

A.3.1 **Date of statement**

1	Date of statement? (yy-mm-dd)
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A.3.2 **Implementation details**

The supplier of the protocol implementation shall specify the information necessary to uniquely identify the implementation and the system in which it may reside. This may include details of:

- a) supplier, implementation name, operating system, suitable hardware;
- b) system supplier and/or client of the test laboratory that is to test the implementation;
- c) information on whom to contact if there are queries concerning the content of the PICS;

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A.4 Protocol Identification

A.4.1 ITU-T Rec. X.227 | ISO/IEC 8650-1 protocol details

	Identification of Protocol Specification	Support
–	ITU-T Rec. X.227 (1995) ISO/IEC 8650-1:1995	
1		
2		
3		

A.4.2 ITU-T Rec. X.227 | ISO/IEC 8650-1 protocol versions

Which version of the ACSE protocol is described in this PICS?

		Status	Support	Mnemonic
1	Version 1	o.1		A-V1
2	Version 2	o.1		

o.1: support of the implementation of only *one* version of the protocol shall be described in this proforma (see below).

An implementation shall be described by completing a separate PICS proforma for each supported protocol version. PICS documents for all versions of the protocol for which conformance is claimed should be attached to each other and used together.

Which other versions of the ACSE protocol does the implementation support?

		Status	Support	Comment
1	Version 1	o		
2	Version 2	o		

A.4.3 ITU-T Rec. X.227 | ISO/IEC 8650-1 technical corrigenda implemented

Identification of corrigenda applied to the implementation	ITU-T Rec. X.227 (1995) ISO/IEC 8650-1:1995 Corr: Corr: Corr: Corr: Corr:
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A.5 Global statement of conformance

1	Are all mandatory features implemented? (yes or no)
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NOTE – If a positive response is not given to this box, then the implementation does not conform to ITU-T Rec. X.227 | ISO/IEC 8650-1.

A.6 Supported roles

A.6.1 Association establishment procedure

	Role	Status	Support	Mnemonic
1	Initiator	o.2		A-CON_initiator
2	Responder	o.2		A-CON_responder

o.2: a conforming implementation shall support at least one of the roles.

A.6.2 Normal release procedure

	Role	Status	Support	Mnemonic
1	Initiator	o		A-REL_initiator
2	Responder	o		A-REL_responder

A.6.3 Abnormal release procedure

	Role	Status	Support	Mnemonic
1	Initiator	m		
2	Responder	m		

A.7 Protocol mechanisms

	Protocol mechanism	Status	Support	Mnemonic
1	Normal mode	o.4		
2	X.410 (1984) mode	o.4		
3	Rules for extensibility	m		
4	Support operation of Session version 2	o		S-O-SESS-V2

o.4: either Normal mode or X.410-1984 mode or both shall be supported. If only X.410-1984 mode is supported, then the remainder of the proforma shall be ignored.

A.8 Functional units

	Protocol mechanism	Status	Support	Mnemonic
1	Normal mode	m		
2	Authentication	o		A-FU(AU)

A.9 Supported APDUs

	APDU	Sender		Receiver		Reference	Comment
		Status	Support	Status	Support		
1	AARQ	c1		c2			
2	AARE	c2		c1			
3	RLRQ	c3		c4			
4	RLRE	c4		c3			
5	ABRT	c5		c5			

c1: if [A-CON_initiator] then m else n/a.
 c2: if [A-CON_responder] then m else n/a.
 c3: if [A-REL_requestor] then m else n/a.
 c4: if [A-REL_acceptor] then m else n/a.
 c5: if [S-O-SESS-V2] then m else n/a.

A.10 Supported APDU parameters

A.10.1 A-associate-request (AARQ)

	Parameter	Sender		Receiver	
		Status	Support	Status	Support
1	Protocol version	c6		c2	
2	Application context name	c1		c2	
3	Calling AP title	c6		c2	
4	Calling AE qualifier	c6		c2	
5	Calling AP invocation-identifier	c6		c2	
6	Calling AE invocation-identifier	c6		c2	
7	Called AP title	c6		c2	
8	Called AE qualifier	c6		c2	
9	Called AP invocation-identifier	c6		c2	
10	Called AE invocation-identifier	c6		c2	
11	ACSE-requirements	c8		c9	
12	Authentication-mechanism name	c8		c9	
13	Authentication-value	c8		c9	
14	Implementation information	c6		c7	
15	User information	c6		c7	

c1: if [A-CON_initiator] then m else n/a.
 c2: if [A-CON_responder] then m else n/a.
 c6: if [A-CON_initiator] then o else n/a.
 c7: if [A-CON_responder] then o else n/a.
 c8: if [A-CON_initiator and A-FU(AU)] then m else n/a.

A.10.2 A-associate-response (AARE)

Parameter		Sender		Receiver	
		Status	Support	Status	Support
1	Protocol version	c7		c1	
2	Application context name	c2		c1	
3	Responding AP title	c7		c1	
4	Responding AE qualifier	c7		c1	
5	Responding AP invocation-identifier	c7		c1	
6	Responding AE invocation-identifier	c7		c1	
7	Result	c2		c1	
8	Result source – diagnostic	c10		c11	
9	ACSE-requirements	c9		c8	
10	Authentication-mechanism name	c9		c8	
11	Authentication-value	c9		c8	
12	Implementation information	c10		c6	
13	User information	c10		c6	

- c1: if [A-CON_initiator] then m else n/a.
c2: if [A-CON_responder] then m else n/a.
c6: if [A-CON_initiator] then o else n/a.
c7: if [A-CON_responder] then o else n/a.
c8: if [A-CON_initiator and A-FU(AU)] then m else n/a.
c9: if [A-CON_responder and A-FU(AU)] then m else n/a.
c10: if [A-CON_responder] then (if [A-FU(AU)] then m (with a value range of 0 to 14) else m (with a value range of 0 to 10)) else n/a.
c11: if [A-CON_initiator] then (if [A-FU(AU)] then m (with a value range of 0 to 14) else m (with a value range of 0 to 10)) else n/a.

A.10.3 A-release-request (RLRQ)

	Parameter	Sender		Receiver	
		Status	Support	Status	Support
1	Reason	c12		c4	
2	User information	c12		c4	

- c4: if [A-REL_acceptor] then m else n/a.
c12: if [A-REL_requestor] then o else n/a.

A.10.4 A-release-response (RLRE)

	Parameter	Sender		Receiver	
		Status	Support	Status	Support
1	Reason	c13		c3	
2	User information	c13		c3	

c3: if [A-REL_requestor] then m else n/a.

c13: if [A-REL_acceptor] then o else n/a.

A.10.5 A-abort (ABRT)

	Parameter	Sender		Receiver	
		Status	Support	Status	Support
1	Abort source	m		m	
2	Diagnostic	c14		c14	
3	User information	o		m	

c14: c14: if [A-FU(AU)] then m else n/a.

A.11 Supported parameter forms**A.11.1 AE title name form**

	Syntax form	Sender		Receiver	
		Status	Support	Status	Support
1	Form 1 (Directory name)	o.5		m	
2	Form 2 (Object identifier and integer)	o.5		m	

o.5: a conforming implementation shall support at least one of the forms.

A.11.2 Authentication value form

Prerequisite: A-FU(AU)

	Authentication value form	Sender		Receiver	
		Status	Support	Status	Support
1	GraphicString	o.6		c14	
2	BIT STRING	o.6		c14	
3	EXTERNAL	o.6		c14	
4	Other	o.6		c14	

o.6: a conforming implementation shall support at least one of the forms.
c14: if [A-FU(AU)] then m else n/a.

End Of PICS Proforma