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SERIES X: DATA NETWORKS AND OPEN SYSTEM COMMUNICATION

Open System Interconnection – PICS proformas

Information technology – Open Systems Interconnection – Protocol specification for the association control service element: Protocol Implementation Conformance Statement (PICS) proforma

ITU-T Recommendation X.247

(Previously "CCITT Recommendation")

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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.247 was approved on 5th of October 1996. The identical text is also published as ISO/IEC International Standard 8650-2.

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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Summary

This Recommendation | International Standard describes the protocol implementation conformance statement for the OSI association control service element protocol (see ITU-T Rec. X.852 | ISO/IEC 9805-1). The PICS present, in a tabular form, the mandatory and optional elements of the ACSE protocol. The PICS are utilized to represent the choices and features of a particular implementation of OSI ACSE.

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 (see 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 mimum 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-proccess 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 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 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 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.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 8649:1996, *Information technology – Open Systems Interconnection – Service definition for the association control service element.*
- ITU-T Recommendation X.225 (1995) | ISO/IEC 8327-1:1996, *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 8650-1:1996, *Information technology – Open Systems Interconnection – Connection-oriented protocol for the association control service element: Protocol specification.*

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 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 A[1)]

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.

Table A.1

Identification of corrigenda applied to this PICS proforma	ITU-T Rec. X.247 (1996) | ISO/IEC 8650-2:1997 Corr: Corr: Corr:

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:

A.2.2.1.1 (PICS) item: A row in a PICS proforma table.

A.2.2.1.2 (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.

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1) **Copyright release for PICS proforma**
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.

A.2.2.1.3 status (value): An allowed entry in the status column for an item in a PICS proforma table.

A.2.2.1.4 (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 – The capability is required to be implemented, in conformance with ITU-T Rec. X.227 | ISO/IEC 8650-1.

When applied to a parameter on a supported PDU this means that the semantics shall be supported.

'o' Optional – The capability may be implemented, and if it is implemented it is required to conform ITU-T Rec. X.227 | ISO/IEC 8650-1; options can be Boolean, mutually exclusive, or selectable (as described in ITU-T Rec. X.290 | ISO/IEC 9646-1, A.3).

When applied to a parameter on a supported PDU this means that the parsing of the parameter shall be supported but that the semantics may be supported or not.

'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.

'c*n*' 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:

a) Ig or Ignored – The item (e.g. PDU or parameter) is ignored (i.e. processed syntactically but not semantically).

b) 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 subclause A.2 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)

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.

1	

A.4 Protocol Identification

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

	Identification of Protocol Specification	Support
1	ITU-T Rec. X.227 (1995) | ISO/IEC 8650-1:1996	
2		
3		
4		

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				
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				

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 8650-1:1996 Corr: Corr: Corr: Corr: Corr:

A.5 Global statement of conformance

1	Are all mandatory features implemented? (yes or no)

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)
3	Application Context Name Negotiation	o		A-FU(ACN)

A.9 Supported APDUs

	APDU	Sender		Receiver		Reference	Comment
		Status	Support	Status	Support		
1	AARQ	c1		c3			
2	AARE	c3		c1			
3	RLRQ	c5		c7			
4	RLRE	c7		c5			
5	ABRT	c9		c9			

c1: if [A-CON_initiator] then m else n/a.
c3: if [A-CON_responder] then m else n/a.
c5: if [A-REL_requestor] then m else n/a.
c7: if [A-REL_acceptor] then m else n/a.
c9: 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	c10		c3	
2	Application context name	c1		c3	
3	Calling AP title	c6		c4	
4	Calling AE qualifier	c6		c4	
5	Calling AP invocation-identifier	c6		c4	
6	Calling AE invocation-identifier	c6		c4	
7	Called AP title	c6		c4	
8	Called AE qualifier	c6		c4	
9	Called AP invocation-identifier	c6		c4	
10	Called AE invocation-identifier	c6		c4	
11	ACSE-requirements	c8		c15	
12	Authentication-mechanism name	c8		c14	
13	Authentication-value	c8		c14	
14	Application Context Name List	c21		c22	
15	Implementation information	c10		c11	
16	User information	c10		c11	

c1: if [A-CON_initiator] then m else n/a.
c3: if [A-CON_responder] then m else n/a.
c4: if [A-CON_responder] then o else n/a.
c10: if [A-CON_initiator] then o else n/a.
c11: if [A-CON_responder] then o else n/a.
c12: if [A-CON_initiator and A-FU(AU)] then m else n/a.
c13 if [A-CON_initiator and [A-FU(AU) or A-FU(ACN)]] then m else n/a.
c14: if [A-CON_responder and A-FU(AU)] then m else n/a.
c15: if [A-CON_responder and [A-FU(AU) or A-FU(ACN)]] then m else n/a.
c21: if [A-CON_initiator and A-FU(ACN)] then m else n/a.
c22: if [A-CON_responder and A-FU(ACN)] then m else n/a.

A.10.2 A-associate-response (AARE)

Parameter		Sender		Receiver	
		Status	Support	Status	Support
1	Protocol version	c11		c1	
2	Application context name	c3		c1	
3	Responding AP title	c11		c2	
4	Responding AE qualifier	c11		c2	
5	Responding AP invocation-identifier	c11		c2	
6	Responding AE invocation-identifier	c11		c2	
7	Result	c3		c1	
8	Result source – Diagnostic	c16		c17	
9	ACSE-requirements	c15		c13	
10	Authentication-mechanism name	c14		c12	
11	Authentication-value	c14		c12	
12	Application Context Name List	c22		c21	
12	Implementation information	c11		c10	
13	User information	c11		c10	

c1: if [A-CON_initiator] then m else n/a.
c2: if [A-CON_initiator] then m else n/a.
c3: if [A-CON_responder] then m else n/a.
c10: if [A-CON_initiator] then o else n/a.
c11: if [A-CON_responder] then o else n/a.
c12: if [A-CON_initiator and A-FU(AU)] then m else n/a.
c13: if [A-CON_initiator and [A-FU(AU) or A-FU(ACN)]] then m else n/a.
c14: if [A-CON_responder and A-FU(AU)] then m else n/a.
c15: if [A-CON_responder and [A-FU(AU) or A-FU(ACN)]] then m else n/a.
c16: 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.
c17: 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.
c21: if [A-CON_initiator and A-FU(ACN)] then m else n/a.
c22: if [A-CON_responder and A-FU(ACN)] then m else n/a.

A.10.3 A-release-request (RLRQ)

	Parameter	Sender		Receiver	
		Status	Support	Status	Support
1	Reason	c18		c8	
2	User information	c18		c8	

c8: if [A-REL_acceptor] then o else n/a.
c18: 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	c19		c6	
2	User information	c19		c6	
c6: if [A-REL_requestor] then o else n/a. c19: 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	c20		c20	
3	User information	o		m	
c20: if [A-FU(AU) or A-FU(ACN)] then o 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		m	
2	Form 2 (Object identifier and integer)	o		m	

A.11.2 Authentication value form

Prerequisite: A-FU(AU)

	Authentication value form	Sender		Receiver	
		Status	Support	Status	Support
1	GraphicString	o.5		c14	
2	BIT STRING	o.5		c14	
3	EXTERNAL	o.5		c14	
4	Other	o.5		c14	
o.5: 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

Annex B

Summary of conditions

(This annex does not form an integral part of this Recommendation | International Standard)

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

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

o.3: a conforming implementation shall support at least one of the roles.

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.

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

c1: if [A-CON_initiator] then m else n/a.

c2: if [A-CON_initiator] then o else n/a.

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

c4: if [A-CON_responder] then o else n/a.

c5: if [A-REL_requestor] then m else n/a.

c6: if [A-REL_requestor] then o else n/a.

c7: if [A-REL_acceptor] then m else n/a.

c8: if [A-REL_acceptor] then o else n/a.

c9: if [S-O-SESS-V2] then m else n/a.

c10: if [A-CON_initiator] then o else n/a.

c11: if [A-CON_responder] then o else n/a.

c12: if [A-CON_initiator and A-FU(AU)] then m else n/a.

c13: if [A-CON_initiator and [A-FU(AU) or A-FU(ACN)]] then m else n/a.

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

c15: if [A-CON_responder and [A-FU(AU) or A-FU(ACN)]] then m else n/a.

c16: 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.

c17: 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.

c18: if [A-REL_requestor] then o else n/a.

c19: if [A-REL_acceptor] then o else n/a.

c20: if [A-FU(AU) or A-FU(AU)] then o else n/a.

c21: if [A-CON_initiator and A-FU(ACN)] then m else n/a.

c22: if [A-CON_responder and A-FU(ACN)] then m else n/a.

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