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DATA COMMUNICATION NETWORKS

RELIABLE TRANSFER SERVICE ELEMENT – PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS) PROFORMA

Recommendation X.248

FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation X.248 was revised by Study Group VII and was approved under the Resolution No. 2 procedure on the 10th of September 1992.

CCITT NOTES

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

2) A list of abbreviations used in this Recommendation can be found in Annex B.

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Recommendation X.248

RELIABLE TRANSFER SERVICE ELEMENT – PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS) PROFORMA

Introduction

This Recommendation specifies the PICS proforma for the services provided by an application-service-element – the Reliable Transfer Service Element (RTSE) – to provide for the Reliable Transfer of Application Protocol Data Units (APDUs) between open systems. This Recommendation is one of a set of Recommendations specifying the PICS proformas for sets of application-service-elements commonly used by a number of applications.

Reliable Transfer provides an application-independent mechanism to recover from communication and end-system failure minimizing the amount of retransmission.

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).

This Recommendation includes the PICS proforma for the RTSE protocol as defined in the Recommendation X.228.

1 Scope

This Recommendation provides the PICS proforma for the RTSE protocol as specified in Recommendation X.228. This PICS proforma is in compliance with the relevant requirements, and in accordance with the relevant guidance for a PICS proforma, given in ISO/IEC 9646-2. Detail of the use of this proforma is provided in Annex A.

2 Normative references

– CCITT Rec. X.218 (1988), *Reliable transfer: Model and service definition* (see also ISO/IEC 9066-1).

– CCITT Rec. X.228 (1988), *Reliable transfer: Protocol specification* (see also ISO/IEC 9066-2).

– CCITT Rec. X.419 (1992), *Message handling systems: Protocol specifications* (see also ISO/IEC 10021-6)

ISO/IEC 9646-1 (1991), *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts* [see also CCITT Recommendation X.290 (1991)].

ISO/IEC 9646-2 (1991), *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 2: Abstract test suite specification* [see also CCITT Recommendation X.291 (1991)].

3 Definitions

This Recommendation uses terms defined in Recommendations X.218 and X.228.

This Recommendation uses the following terms defined in Recommendation X.419:

a) mts-transfer;

b) mts-transfer-protocol;

c) mts-transfer-protocol-1984;

d) mts-reliable-access;

e) mts-forced-reliable-access; and

f) ms-reliable-access.

This Recommendation uses the following terms defined in ISO/IEC 9646-1:

1) PICS proforma;

2) protocol implementation conformance statement (PICS); and

3) implementation under test (IUT).

4 Abbreviations

Abbreviations defined in Recommendations X.218 and X.228 are used in this Recommendation.

5 Conventions

The PICS proforma is designed in Annex A to this Recommendation.

6 Conformance

The supplier of a protocol implementation that is claimed to conform to Recommendation X.228 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.

ANNEX A

(to Recommendation X.248)
(This annex forms an integral part of this Recommendation)

Reliable Transfer Service Element
Protocol Implementation Conformance Statement (PICS) Proforma

A.1 *Identification of the implementation*

A.1.1 *Identification of PICS*

Table A-1/X.248 shall be used to identify the actual PICS and its relation with the System Conformance Statement for the system in which the IUT resides.

TABLE A-1/X.248

Identification of PICS

Ref. No.	Question	Response
1	Date of statement (DD/MM/YY)	
2	PICS No.	
3	System Conformance Statement Cross Reference	

Copyright release for PICS Proforma:

Users of this Recommendation 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.1.2 *Identification of the IUT*

Table A-2/X.248 shall be used to identify the implementation and the system in which it resides.

TABLE A-2/X.248

Identification of IUT

Ref. No.	Question	Response
1	Implementation	
2	Version	
3	Machine Name	
4	Machine version	
5	Operating System Name	
6	Operating System Version	
7	Special Configuration	
8	Other information	

A.1.3 *Supplier identification*

Table A-3/X.248 shall be used to identify the supplier of the system and/or the client of the test laboratory that is to test the implementation, and the person to contact if there are any queries concerning the content of the PICS.

TABLE A-3/X.248

Supplier Identification

Ref. No.	Question	Response
1	Organization	
2	Contact Name(s)	
3	Address	
4	Telephone	
5	Telex	
6	Fax	
7	E-mail	
8	Other information	

A.2 *Identification of protocol*

Table A-4/X.248 shall be used to identify the Recommendation to which the PICS applies.

TABLE A-4/X.248

Identification of Protocol

Ref. No.	Question	Response
1	Reference No. and title	Rec. X.228 – Reliable transfer: Protocol specification
2	Protocol version	
3	Implemented Defect Reports (Implementors Guide, Version No.)	

A.3 *Global statement of conformance*

TABLE A-5/X.248

Global Statement of Conformance

Ref. No.	Question	Response
1	Are all mandatory capabilities implemented?	

Note – Answering "No" to this question indicates non-conformance to the protocol specification. Non-supported mandatory capabilities are to identified in the PICS, with an explanation of why the implementation is non-conformant. Such information shall be provided in § A.6.8, Other information.

A.4 *Instructions for completing the PICS proforma*

A.4.1 *Definition of support*

A capability is said to be supported for origination (ORIGINATE) if the Implementation Under Test (IUT) is able

- to generate the corresponding service parameters (either automatically or because the end-user explicitly requires that capability), and receive the corresponding service parameters sent in response from the peer system; and
- to interpret, handle and when required make available to the end user the corresponding service parameters.

A capability is said to be supported for reception (RECEIPT) if the IUT is able

- to receive the corresponding service parameters from the peer system requesting that capability, and respond to the requested capability; and
- to interpret, handle and when required make available to the end user the corresponding service parameters.

A protocol element is said to be supported for origination (ORG) if the IUT is able to generate it under some circumstances (either automatically or because the end-user explicitly requires a related service).

A protocol element is said to be supported for reception (REC) if it is correctly interpreted and handled and also, when required, made available to the end user.

Since the requirements for support may be different for origination and reception of the capabilities and protocol elements, the tables have been divided in the corresponding columns, or two entry lines are provided for the corresponding declarations.

A.4.2 *D column*

This column indicates the level of support required for conformance to the CCITT Recommendation. The values are as follows:

m Mandatory support is required.

o Optional support is permitted for conformance to the Recommendation. If implemented it must conform to the specifications and restrictions contained in the Recommendation. These restrictions may affect the optionality of other items.

o.<n> Options mutually exclusive or selectable among a set (where <n> is a number reference for identification). The criteria is defined at the bottom of the relevant table.

c<n> The item is conditional (where <n> is the number which identifies the condition which is applicable). The definition of conditional statements used, are given at the bottom of the relevant table.

d Default value defined in the Recommendation. When absent in the PDU, both Originator and Receiver shall interprete it as having the default value specified in the Recommendation.

x The item is prohibited, and shall not be supported, or shall be capable of being debarred in this mode of operation.

– The item is not applicable.

A.4.3 *I column*

This 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 that column are:

Y Yes, the feature has been implemented.

N No, the feature has not been implemented.

– The item is not applicable.

In the PICS proforma tables, every leading feature marked ‘m’ should be supported by the IUT. Sub-features marked ‘m’ should be supported if the corresponding leading feature is supported by the IUT.

All entries within the PICS proforma shall be made in ink. Alterations to such entries shall be made by crossing out, not erasing nor making the original entry illegible, and writing the new alongside. All such alterations to records shall be initialled by the staff making them.

Recognising that the level of details required may, in some instances, exceed the space available for responses, addition of appendices to the PICS is allowed under these circumstances, when properly referenced.

A.4.4 *Constraints for maximum length*

For each line for which there is a constraint on maximum length, the constraint is defined in the ‘STD.’ column.

In the ‘IMP.’ columns the minimum and maximum length shall be entered for origination, and the maximum length shall be entered for reception.

A.4.5 *Constraints for supported values*

For each line for which there is a constraint for supported values, the constraint is defined in the ‘STD.’ column.

In the ‘IMP.’ columns the supported values shall be entered for origination and reception.

A.4.6 *Note or Mode column*

The 'Note or Mode' column shall be read as follows:

NM – The requirements stated in this line applies when the IUT operates in Normal Mode. The declarations shall be made for this mode of operation.

XM – The requirements stated in this line applies when the IUT operates in X.410-1984 Mode. The declarations shall be made for this mode of operation.

Nxx – Refers to Note xx.

A.4.7 *Section reference column*

The column 'Section Reference' gives reference to the relevant CCITT Recommendation, and the corresponding section for the requirement of support.

A.4.8 *Item reference numbers*

Each line within the PICS proforma which requires implementation details to be entered is numbered at the left hand edge of the line. This numbering is included as a means of uniquely identifying all possible implementation details within the PICS proforma. This referencing is used both inside the PICS proforma, and for references from other Test Specification documents.

The means of referencing individual responses is done by the following sequence:

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 is implicitly labelled a, b, c, etc. from left to right, and this letter is appended to the sequence.

An example of the use of this notation would be A.6.2.3/5.1b, which refers to the support for the receipt of Turn-give in Normal Mode.

A.5 *Abbreviations*

Abbreviations used in Recommendations X.218 and X.228 are used in this PICS proforma.

In addition the abbreviations defined in § A.4 of this PICS proforma are used.

A.6 *Capabilities and options*

A.6.1 *Initiator/Responder capability*

Table A-6/X.248 is used to specify whether the implementation is able to initiate communication, respond to communication by another system, or both.

TABLE A-6/X.248

Initiator/Responder Capability

Item reference No.	Capability	Section reference (Rec. X.228)	Note or mode	D	I
1	Initiator	–		o.1	[ ]
2	Responder	–		o.1	[ ]

o.1 At least one of these capabilities must be supported.

A.6.2 *Major capabilities*

A.6.2.1 *Protocol mechanisms*

Table A-7/X.248 is used to specify whether the implementation supports Normal Mode or X.410-1984 Mode, or both.

TABLE A-7/X.248

Supported Modes of Operation

Item reference No.	Capability	Section reference (Rec. X.228)	Note or mode	D	I
1	Normal Mode	–		o.2	[ ]
2	X.410 – 1984 Mode	–		o.2	[ ]

o.2 At least one of these Modes of Operation must be supported.

A.6.2.2 *Two way alternate dialogue mode*

Table A-8/X.248 is used to specify whether the implementation supports Two Way Alternate (TWA) Dialogue Mode.

TABLE A-8/X.248

Supported Dialogue Mode

Item reference No.	Capability	Section reference (Rec. X.228)	Note or mode	ORIGINATE		RECEIPT	
				D	I	D	I
1.1 1.2	Two Way Alternate Dialogue Mode	7.1	NM XM	m o	[ ] [ ]	m o	[ ] [ ]

A.6.2.3 *Elements of procedure*

Table A-9/X.248 is used to specify the Elements of Procedure supported by the IUT.

TABLE A-9/X.248

Elements of Procedure

Item reference No.	Capability	Section reference (Rec. X.228)	Note or mode	ORIGINATE		RECEIPT	
				D	I	D	I
1	Association Establishment	7.1		c1	[ ]	c2	[ ]
2	Association Release	7.2		c2	[ ]	c2	[ ]
3	Transfer	7.3		m	[ ]	m	[ ]
4.1 4.2	Turn-please	7.4	NM XM	m c3	[ ] [ ]	m c3	[ ] [ ]
5.1 5.2	Turn-give	7.5	NM XM	m c3	[ ] [ ]	m c3	[ ] [ ]
6	User-exception-report	7.6.1		m	[ ]	m	[ ]
7	Provider-exception-report	7.6.2		–	–	m	[ ]
8	Transfer-interrupt	7.7.1		m	[ ]	m	[ ]
9	Transfer-discard	7.7.2		m	[ ]	m	[ ]
10	Association-abort	7.7.3		m	[ ]	m	[ ]
11	Association-provider-abort	7.7.4		–	–	m	[ ]
12	Transfer-resumption	7.8.1		m	[ ]	m	[ ]
13	Transfer-retry	7.8.2		m	[ ]	m	[ ]
14	Association-recovery	7.8.3		m	[ ]	m	[ ]
15	Transfer-abort	7.9.1		m	[ ]	m	[ ]
16.1 16.2	Provider-abort	7.9.2	NM XM	m x	[ ] [ ]	m –	[ ] –
17.1 17.2	User-abort	7.9.3	NM XM	m x	[ ] [ ]	m –	[ ] –

c1 m if Initiator capability is supported (see § A.6.1 and Table A-6/X.248, item 1).

c2 m if Responder capability is supported (see § A.6.1 and Table A-6/X.248, item 2).

c3 m if Two Way Alternate Dialogue Mode is supported (see § A.6.2.2 and Table A-8/X.248, item 1.1).

A.6.3 *Timers and protocol parameters*

A.6.3.1 *Timers*

Table A-10/X.248 is used to specify the support by the IUT of Timers and Protocol parameters used by the Reliable Transfer Protocol Machine.

TABLE A-10/X.248

Timers

Item reference No.	Timer name	Section reference (Rec. X.228)	Note or mode	D	I
1	Transfer Timer	A.4.4		m	[ ]
2	Recovery Timer	A.4.5		m	[ ]
3	Time Recover Timer	7.8.3.3.3		m	[ ]

A.6.3.2 *Protocol parameters*

Not applicable.

A.6.4 *Supported PDUs*

Table A-11/X.248 is used to declare the support of the RTSE PDUs for the IUT.

TABLE A-11/X.248

Supported PDUs

Item reference No.	RTSE PDU name	Section reference (Rec. X.228)	Note or mode	ORIGINATE		RECEIPT	
				D	I	D	I
1	RTORQapdu	7.1.2.1		c1	[ ]	c2	[ ]
2	RTOACapdu	7.1.2.2		c2	[ ]	c1	[ ]
3	RTORJapdu	7.1.2.3		m	[ ]	m	[ ]
4.1 4.2	RTTPapdu	7.4.2	NM XM	m c3	[ ] [ ]	m m	[ ] [ ]
5	RTTRapdu	7.3.2		m	[ ]	m	[ ]
6	RTABapdu	7.7.3.2		m	[ ]	m	[ ]

c1 m if Initiator capability is supported (see § A.6.1 and Table A-6/X.248, item 1).

c2 m if Responder capability is supported (see § A.6.1 and Table A-6/X.248, item 2).

c3 m if Two Way Alternate Dialogue Mode is supported (see § A.6.2.2 and Table A-8/X.248, item 1.2).

A.6.5 *Supported PDU parameters*

Tables A-12/X.248 to A-17/X.248 are used to specify the support by the IUT of the parameters of the RTSE APDUs.

A.6.5.1 *RTORQapdu*

TABLE A-12/X.248

RTORQapdu parameters

RTSE PDU: RTORQapdu										
Item reference No.	Parameter name	Section reference (Rec. X.228)	Note or mode	ORG or REC	D	I	Maximum octets length		Value	
							STD.	IMP.	STD.	IMP.
1.1 1.2	checkpointSize	7.1.4.1		ORG REC	d m	[ ] [ ]				
2.1 2.2	windowSize	7.1.4.2		ORG REC	d m	[ ] [ ]				
3.1 3.2 3.3 3.4	dialogueMode	7.1.4.3	NM XM	ORG REC ORG REC	m m d m	[ ] [ ] [ ] [ ]			1 1 0, 1 0, 1	
4.1 4.2	connectionDataRQ	–		ORG REC	m m	[ ] [ ]				
4.1.1 4.2.1	open	7.1.4.4	N1	ORG REC	m m	[ ] [ ]				
4.1.2 4.2.2	recover	7.8.3.4.5	N2	ORG REC	m m	[ ] [ ]				
4.1.2.1 4.2.2.1	CallingSSuser-Reference	–		ORG REC	m m	[ ] [ ]	64 64			
4.1.2.2 4.2.2.2	CommonReference	–		ORG REC	m m	[ ] [ ]	17 17			
4.1.2.3 4.2.2.3	AdditionalReferenceInformation	–		ORG REC	o m	[ ] [ ]	4 4			
5.1 5.2 5.3 5.4	applicationProtocol	7.1.4.6	NM XM	ORG REC ORG REC	x – m m	[ ] – [ ] [ ]			 1, 12 1, 12	

Note 1 – Not used in Association – recovery procedure (See Rec. X.228, § 7.8.3.4.4).

Note 2 – Not used used in Association – establishment procedure (See Rec. X.228, § 7.1.4.5).

A.6.5.2 *RTOACapdu*

TABLE A-13/X.248

RTOACapdu parameters

RTSE PDU: RTOACapdu										
Item reference No.	Parameter name	Section reference (Rec. X.228)	Note or mode	ORG or REC	D	I	Maximum octets length		Value	
							STD.	IMP.	STD.	IMP.
1.1 1.2	checkpointSize	7.1.5.1		ORG REC	d m	[ ] [ ]				
2.1 2.2	windowSize	7.1.5.2		ORG REC	d m	[ ] [ ]				
3.1 3.2	connectionDataAC	–		ORG REC	m m	[ ] [ ]				
3.1.1 3.2.1	open	7.1.5.3	N1	ORG REC	m m	[ ] [ ]				
3.1.2 3.2.2	recover	7.8.3.5.4	N2	ORG REC	m m	[ ] [ ]				
3.1.2.1 3.2.2.1	CalledSSuser-Reference	–		ORG REC	m m	[ ] [ ]	64 64			
3.1.2.2 3.2.2.2	CommonReference	–		ORG REC	m m	[ ] [ ]	17 17			
3.1.2.3 3.2.2.3	AdditionalReferenceInformation	–		ORG REC	o m	[ ] [ ]	4 4			

Note 1 – Not used in Association – recovery procedure (See Rec. X.228, § 7.8.3.5.3).

Note 2 – Not used used in Association – establishment procedure (See Rec. X.228, § 7.1.5.4).

A.6.5.3 *RTORJapdu*

TABLE A-14/X.248

RTORJapdu parameters

RTSE PDU: RTORJapdu										
Item reference No.	Parameter name	Section reference (Rec. X.228)	Note or mode	ORG or REC	D	I	Maximum octets length		Value	
							STD.	IMP.	STD.	IMP.
1.1	refuseReason	7.1.6.1	NM	ORG	x	[ ]				
1.2				REC	–	–				
1.3			XM, N3	ORG	o	[ ]			0:3	
1.4				REC	m	[ ]			0:3	
2.1	userDataRJ	7.1.6.2	NM, N1	ORG	o	[ ]				
2.2				REC	o	[ ]				
2.3			XM	ORG	x	[ ]				
2.4				REC	–	–				

Note 1 – Not used in Association – recovery procedure (See Rec. X.228, § 7.8.3.6.4).

Note 2 – In the Association – recovery procedure, the "refuseReason" can only have the values "1" (rtsBusy) and "2" (cannotRecover) (See Rec. X.228, § 7.8.3.6.1).

A.6.5.4 *RTTPapdu*

TABLE A-15/X.248

RTTPapdu parameters

RTSE PDU: RTTPapdu										
Item reference No.	Parameter name	Section reference (Rec. X.228)	Note or mode	ORG or REC	D	I	Maximum octets length		Value	
							STD.	IMP.	STD.	IMP.
1.1	Priority	7.4.4.1		ORG	m	[ ]			0:3	
1.2				REC	m	[ ]			0:3	

A.6.5.5 *RTTRapdu*

TABLE A-16/X.248

RTTRapdu parameters

RTSE PDU: RTTRapdu										
Item reference No.	Parameter name	Section reference (Rec. X.228)	Note or mode	ORG or REC	D	I	Maximum octets length		Value	
							STD.	IMP.	STD.	IMP.
1.1	User Data Part	7.3.2		ORG	m	[ ]				
1.2				REC	m	[ ]				

A.6.5.6 *RTABapdu*

TABLE A-17/X.248

RTABapdu parameters

RTSE PDU: RTABapdu										
Item reference No.	Parameter name	Section reference (Rec. X.228)	Note or mode	ORG or REC	D	I	Maximum octets length		Value	
							STD.	IMP.	STD.	IMP.
1.1 1.2 1.3 1.4	abortReason	7.7.3.4.1	NM, N4 XM	ORG REC ORG REC	o m o m	[ ] [ ] [ ] [ ]			0:7 0:7 0:4, 7 0:4, 7	
2.1 2.2	reflectedParameter	7.7.3.4.2	N5	ORG REC	o o	[ ] [ ]	1 1			
3.1 3.2 3.3 3.4	userdataAB	7.9.3.4.3	NM, N6 XM	ORG REC ORG REC	o o x –	[ ] [ ] [ ] –				

Note 1 – The "abortReason" can only have the value "5" (permanentProblem) in the Provider Abort procedure, and the value "6" (userError) in the User abort procedure (See Rec. X.228, §§ 7.9.2.4.1 and 7.9.3.4.1).

Note 2 – Only used in the Association Abort procedure, and only when "abortReason" has the value "1" (invalidParameter) (See Rec. X.228, §§ 7.7.3.4.1, 7.9.2.4.2 and 7.9.3.4.2).

Note 3 – Only used in the User Abort procedure (See Rec. X.228, §§ 7.7.4.3 and 7.9.2.4.3).

A.6.6 *Negotiation capabilities*

For negotiations of checkpointsize and windowsize, refer to the declarations of implemented values for corresponding parameters of the RTORQapdu (see § A.6.5.1) and the RTOACapdu (§ A.6.5.2).

A.6.7 *Protocol error handling*

Table A-18/X.248 is used to specify the actions performed by the IUT in the case of protocol error.

TABLE A-18/X.248

Protocol Error Handling

Protocol error handling						
Item reference No.	Error type	Section reference (Rec. X.228)	Note or mode	Action	D	I
1	Undefined PDU parameter	7.10		Ignore parameter	m	[ ]
2	Undefined incoming event from RTSE-user or internal to RTPM	A.3.1.a)		(Local matter)	o	[ ]
3.1 3.2	Undefined incoming event from APDU, PS-provider or ACSE-provider	A.3.1.b)		Appropriate internal event, or Issue RT-PAind and RTAB outgoing event	o.3 o.3	[ ] [ ]

o.3 One of these Protocol Error Handling procedures must be supported.

A.6.8 *Other information*

Table A-19/X.248 can be used to provide any other relevant information.

TABLE A-19/X.248

Other Information

A.7 *Multi-layer dependencies*

A.7.1 *Upper layers*

The Application Context in which the RTSE Implementation is used imposes some additional requirements to some of the elements of this PICS proforma. The following table gives the reference to the appropriate PICS, which imposes some additional requirements for each Application Context, where RTSE can be used.

Table A-20/X.248 shall be filled in with the Application Context in which the IUT operates.

TABLE A-20/X.248

Application Context

Item reference No.	Application context	PICs reference	I
1	mts-transfer-protocol-1984	X.482: A.7.2.1	[ ]
2	mts-transfer-protocol	X.482: A.7.2.1	[ ]
3	mts-transfer	X.482: A.7.2.1	[ ]
4	mts-reliable-access (UA)	X.483: A.7.2.2	[ ]
5	mts-reliable-access (MTA)	X.483: A.7.2.2	[ ]
6	mts-forced-reliable-access (UA)	X.483: A.7.2.2	[ ]
7	mts-forced-reliable-access (MTA)	X.483: A.7.2.2	[ ]
8	ms-reliable-access (UA)	X.484: A.7.2.2	[ ]
9	ms-reliable-access (MS)	X.484: A.7.2.2	[ ]

A.7.2 *Lower layers*

The RTSE imposes the following modifications on the lower layers:

A.7.2.1 *ACSE (ISO/IEC DIS 8650-2)*

The modifications imposed on the ACSE implementation are imposed by the Application Context.

A.7.2.2 *Presentation (ISO/IEC DIS 8823-2)*

The modifications imposed on the Presentation implementation are imposed by the Application Context.

A.7.2.3 *Session*

Table A-21/X.248 shows the requirements RTSE implies on the Session implementation.

TABLE A-21/X.248

Requirements to Session

Functional unit	D	I
Half-duplex	m	[ ]
Exceptions	m	[ ]
Minor Synchronize	m	[ ]
Activity Management	m	[ ]

ANNEX B

(to Recommendation X.248)

Alphabetical list of abbreviations used in this Recommendation

ACSE Association control service element

APDU Application protocol data unit

IMP Implemented

IUT Implementation under test

NM Normal mode

ORG Origination

PDU Protocol data unit

PICS Protocol implementation conformance statement

REC Reception

RTPM Reliable transfer protocol machine

RTSE Reliable transfer service element

STD Standard

TWA Two way alternate

XM X.410 mode