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X.582

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DATA COMMUNICATION NETWORKS

DIRECTORY SYSTEM PROTOCOL – PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS)

Recommendation X.582

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.582 was prepared by Study Group VII and was approved under the Resolution No. 2 procedure on the 10th of September 1992.

CCITT NOTE

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

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INTRODUCTION

This Recommendation, together with the others of the series, has been produced to facilitate the interconnection of information processing systems to provide directory services. The set of all such systems, together with the directory information which they hold, can be viewed as an integrated whole, called the *Directory*. The information held by the Directory, collectively known as the Directory Information Base (DIB), is typically used to facilitate communication between, with or about objects such as application entities, people, terminals and distribution lists.

The Directory plays a significant role in Open Systems Interconnection, whose aim is to allow, with a minimum of technical agreement outside of the interconnection standards themselves, the interconnection of information processing systems:

– from different manufacturers;

– under different managements;

– of different levels of complexity; and

– of different ages.

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 statement is called a Protocol Implementation Conformance Statement (PICS).

This Recommendation specifies the PICS proforma for the Directory System Protocol as defined in the 1988 X.500-Series Recommendations.

Recommendation X.582

DIRECTORY SYSTEM PROTOCOL – PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS)

(1992)

1 Scope

1.1 This Recommendation provides the PICS Proforma for the DSP specified in the 1988 X.500-Series Recommendations. This PICS Proforma is in compliance with the relevant requirements, and in accordance with the relevant guidance for PICS Proforma, given in ISO/IEC 9646-2.

1.2 Details of the use of this Proforma is provided in Annex A.

1.3 The scope of this Recommendation is the specification of the conformance statements for a co-operating Directory System Agent (DSA).

2 Normative references

– CCITT Recommendation X.500 (1988), *The Directory – Overview of Concepts, Models and Services.*

– CCITT Recommendation X.501 (1988), *The Directory – Models.*

– CCITT Recommendation X.509 (1988), *The Directory – Authentication Framework.*

– CCITT Recommendation X.511 (1988), *The Directory – Abstract Service Definition.*

– CCITT Recommendation X.518 (1988), *The Directory – Procedure for Distributed Operation.*

– CCITT Recommendation X.519 (1988), *The Directory – Protocol Specifications.*

– CCITT Recommendation X.520 (1988), *The Directory – Selected Attribute Types.*

– CCITT Recommendation X.521 (1988), *The Directory – Selected Object Classes.*

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 (1992].

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 (1992)].

3 Definitions

This Recommendation uses terms defined in 1988 X.500-Series Recommendations.

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

– Protocol Implementation Conformance Statement (PICS);

– PICS Proforma;

– conformance;

– mandatory requirement;

– optional requirement;

– conditional requirement.

This Recommendation uses the following term:

co-operating DSA: A DSA that has the capability of using the Directory System Protocol.

4 Abbreviations

Abbreviations defined in 1988 X.500-Series Recommendations are used in this Recommendation.

5 Conventions

The PICS Proforma is designed as an annex to this Recommendation.

6 Conformance

The supplier of a DSP implementation that is claimed to conform to 1988 X.500-Series Recommendations 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.582)

Directory System Protocol –
Protocol Implementation Conformance Statement (PICS) Proforma

(This Annex forms an integral part of this Recommendation)

A.1 *Identification of the implementation*

A.1.1 *Identification of PICS*

Item	Question	Response
A.1.1.1	Date of Statement (DD/MM/YY)	
A.1.1.2	PICS Serial Number	
A.1.1.3	System Conformance Statement Cross Reference	

A.1.2 *Identification of the implementation and/or system*

Item	Question	Response
A.1.2.1	Implementation Name	
A.1.2.2	Version Number	
A.1.2.3	Machine Name	
A.1.2.4	Machine Version Number	
A.1.2.5	Operating System Name	
A.1.2.6	Operating System Version No.	
A.1.2.7	Special Configuration [a)]	
A.1.2.8	Other information	

[a)] Please enter at least one of the following configurations:

- non-First-Level DSA
- First-Level DSA

Copyright release for PICS Proforma:

Users of this document 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.1.3 *Identification of the system supplier and/or test laboratory client*

Item	Question	Response
A.1.3.1	Organization Name	
A.1.3.2	Contact Name (s)	
A.1.3.3	Address	
A.1.3.4	Telephone Number	
A.1.3.5	Telex Number	
A.1.3.6	Fax Number	
A.1.3.7	E-Mail Address	
A.1.3.8	Other Information	

A.2 *Identification of the protocol*

Item	Question	Response
A.2.1	Title, Reference Number, publication date of the protocol standard	
A.2.2	Protocol Version Number	
A.2.3	Implemented Addenda	
A.2.4	Implemented Defect Reports (Ref. No.)	

A.3 *Global statement of conformance*

Answering "No" to item A.3.1 indicates non-conformance to the protocol specification. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is non-conformant. Such information shall be provided in § A.6.5 "Other information".

Item	Question	D	I
A.3.1	Are all mandatory general capabilities implemented?	m	[ ]
A.3.2	Are minimum knowledge requirements (Rec. X.518) implemented?	m	[ ]
A.3.3	Are all mandatory First-level DSA requirements (Rec. X.518) implemented?	c (Note)	[ ]
A.3.4	Is Cross Reference type implemented?	o	[ ]
A.3.5	Is NSSR (non-specific subordinate reference) implemented?	o	[ ]
A.3.6	Supported Security Level	none, simple, strong	[ ]
A.3.7	Is "DSA Referral Mode" supported?	m	[ ]
A.3.8	Is "Chaining Mode" supported?	o	[ ]
A.3.9	Is the alias mechanism implemented?	o	[ ]

Note — This item is mandatory if the special configuration in item A.1.2.7 is a First-level DSA.

A.4 *Instructions for completing the PICS Proforma*

A.4.1 *Definition of support*

A DSA implementation may be an invoker and/or a consumer of a DSA operation unless "Chaining Mode" is supported, then the DSA implementatin must be able to invoke and consume DSA operations.

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

– to generate the corresponding operation parameters (either automatically or because the invoker requires that capability explicitly);

– to interpret, handle and when required make available to the invoker the corresponding error or result.

A protocol element is said to be supported for a sending implementation if the IUT is able to generate it under some circumstances (either automatically or because the invoker requires relevant services explicitly).

A protocol element is said to be supported for a receiving implementation if it is correctly interpreted and handled and also, when appropriate, made available to the invoker.

An object class is said to be supported if the IUT is able to construct entries of that object class. Support of an object class also requires support of the object identifier(s) of its superclass(es) of that object class.

An attribute type is said to be supported by a DSA implementation if the DSA supports a subset or all aspects of the attribute syntax of the attribute and stores the attribute value(s) where appropriate.

A.4.2 *D (Defined) 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.

c The item is conditional (support of the capability is subject to a predicate).

– The item is not applicable.

A.4.3 *I (Implemented) column*

This column shall be completed by the supplier or implementor, when either a [ ] or a ( ), to indicate the level of implementation of each item. The proforma has designed such that values required in [ ] are:

Y yes, the item has been implemented;

N no, the item has not been implemented;

– the item is not applicable;

and values in ( ) are:

T strong authentication supported;

S simple authentication supported;

n no authentication supported.

In the PICS Proforma tables, every leading item marked 'm' shall be supported by the IUT. Sub-items marked 'm' shall be supported if the corresponding leading item 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 entry alongside. All such alterations to records shall be initialized by the staff making them.

A.4.4 *Note column*

This column indicates the following:

notexx – Refers to Note xx.

pxx – Refers to predicate pxx.

d(xx) – A default value xx within ( ) is defined in the Recommendation. When absent in the PDU, both invoker and responder shall interpret it as having the default value specified in the Recommendation.

A.4.5 *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 mean 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;

– a solidus character, '/';

– the reference number of the row in which the response appears;

– 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 the item A.6.3.1.1.2, which refers to the support for credentials in a DSABind protocol data unit.

A.4.6 *Predicate definitions*

If the classification of an Element of Service (EOS) or a Protocol Element (PEL) is subject to a predicate support of the item, it is mandatory if the related predicate is true. Otherwise support of the item is optional.

p10: True if the supported security level in the item A.3.6 indicates either "S" (simple) or "T" (strong);

p11: True if the supported security level in the item A.3.6 indicates "S" (simple);

p12: True if the supported security level in the item A.3.6 indicates "T" (strong).

A.5 *Abbreviations*

The following abbreviations are used in this PICS Proforma:

c conditional;

D Defined;

d default;

I Implemented;

Init/Res Initiator/Responder;

m mandatory;

N No;

N/A Not Applicable;

o optional;

Y Yes.

A.6 *Capabilities and options*

This part of the PICS Proforma identifies the supported application context, the PDUs, and operations. Finally, the operation arguments and PDU parameters, and supported object classes and attribute types are identified.

A.6.1 *Supported application context*

The only application context supported by this PICS Proforma is Directory System application context.

A.6.2 *Operations*

Item	Operation				D	I	Note	Reference
A.6.2.1	DSABind				m	[ ]		§ A.6.3.1
A.6.2.2	DSAUnbind				m	[ ]		§ A.6.3.2
A.6.2.3	ChainedRead				m	[ ]		§ A.6.3.3
A.6.2.4	ChainedCompare				m	[ ]		§ A.6.3.4
A.6.2.5	ChainedAbandon				m	[ ]		§ A.6.3.5
A.6.2.6	ChainedList				m	[ ]		§ A.6.3.6
A.6.2.7	ChainedSearch				m	[ ]		§ A.6.3.7
A.6.2.8	ChainedAddEntry				m	[ ]		§ A.6.3.8
A.6.2.9	ChainedRemoveEntry				m	[ ]		§ A.6.3.9
A.6.2.10	ChainedModifyEntry				m	[ ]		§ A.6.3.10
A.6.2.11	ChainedModifyRDN				m	[ ]		§ A.6.3.11

A.6.3 *Protocol elements*

A.6.3.1 *DSABind Protocol Elements*

A.6.3.1.1 *DSABind Arguments*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.1.1.1	DirectoryBindArg	m	[ ]	m	[ ]		§ 13.1 (Rec. X.518)
A.6.3.1.1.2	credentials	c	[ ]	c	[ ]	p10	
A.6.3.1.1.3	simple	c	[ ]	c	[ ]	p11	
A.6.3.1.1.4	name	m	[ ]	m	[ ]		
A.6.3.1.1.5	validity	o	[ ]	o	[ ]		
A.6.3.1.1.6	password	o	[ ]	o	[ ]		
A.6.3.1.1.7	strong	o	[ ]	c	[ ]	p12	
A.6.3.1.1.8	externalProcedure	o	[ ]	o	[ ]		
A.6.3.1.1.9	versions	m	[ ]	m	[ ]	d (v1988)	

A.6.3.1.2 *DSABind Result*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.1.2.1	DirectoryBindResult	m	[ ]	m	[ ]		§ 13.1 (Rec. X.518)
A.6.3.1.2.2	credentials	c	[ ]	c	[ ]	p10	
A.6.3.1.2.3	simple	c	[ ]	c	[ ]	p11	
A.6.3.1.2.4	name	m	[ ]	m	[ ]		
A.6.3.1.2.5	validity	o	[ ]	o	[ ]		
A.6.3.1.2.6	password	o	[ ]	o	[ ]		
A.6.3.1.2.7	strong	c	[ ]	c	[ ]	p12	
A.6.3.1.2.8	externalProcedure	o	[ ]	o	[ ]		
A.6.3.1.2.9	versions	m	[ ]	m	[ ]	d (v1988)	

A.6.3.1.3 *DSABind Error*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.1.3.1	DirectoryBindError	m	[ ]	m	[ ]		§ 13.1 (Rec. X.518)
A.6.3.1.3.2	versions	m	[ ]	m	[ ]	d (v1988)	
A.6.3.1.3.2.3	ServiceProblem	m	[ ]	m	[ ]		
A.6.3.1.3.2.4	SecurityProblem	m	[ ]	m			

A.6.3.2 *DSAUnbind Elements*

DSAUnbind has no arguments (refer § 13.2 in X.518).

A.6.3.3 *ChainedRead Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.3.1	ChainingArgument	m	[ ]	m	[ ]		§ A.6.3.21 § 14 (Rec. X.518)
A.6.3.3.2	ReadArgument	m	[ ]	m	[ ]		§ 9.1 (Rec. X.511)
A.6.3.3.3	object	m	[ ]	m	[ ]		
A.6.3.3.4	selection	m	[ ]	m	[ ]		§ A.6.3.16
A.6.3.3.5	CommonArguments	m	[ ]	m	[ ]		§ A.6.3.13
A.6.3.3.6	ChainingResult	m	[ ]	m	[ ]		§ A.6.3.22
A.6.3.3.7	ReadResult	m	[ ]	m	[ ]		
A.6.3.3.8	entry	m	[ ]	m	[ ]		§ A.6.3.17
A.6.3.3.9	CommonResults	m	[ ]	m	[ ]		§ A.6.3.14

A.6.3.4 *ChainedCompare Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.4.1	ChainingArgument	m	[ ]	m	[ ]		§ A.6.3.21 § 14 (Rec. X.518)
A.6.3.4.2	CompareArgument	m	[ ]	m	[ ]		§ 9.2 (Rec. X.511)
A.6.3.4.3	object	m	[ ]	m	[ ]		
A.6.3.4.4	purported	m	[ ]	m	[ ]		
A.6.3.4.5	CommonArguments	m	[ ]	m	[ ]		§ A.6.3.13
A.6.3.4.6	ChainingResult	m	[ ]	m	[ ]		§ A.6.3.22
A.6.3.4.7	CompareResult	m	[ ]	m	[ ]		§ 9.2 (Rec. X.511)
A.6.3.4.8	DistinguishedName	m	[ ]	m	[ ]		
A.6.3.4.9	matched	m	[ ]	m	[ ]		
A.6.3.4.10	fromEntry	m	[ ]	m	[ ]	d(true)	
A.6.3.4.11	CommonResults	m	[ ]	m	[ ]		§ A.6.3.14

A.6.3.5 *ChainedAbandon Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.5.1	ChainingArgument	m	[ ]	m	[ ]		§ A.6.3.21 § 14 (Rec. X.518)
A.6.3.5.2	AbandonArgument	m	[ ]	m	[ ]		§ 9.3 (Rec X.511)
A.6.3.5.3	invokeId	m	[ ]	m	[ ]		
A.6.3.5.4	ChainingResult	m	[ ]	m	[ ]		§ A.6.3.22
A.6.3.5.5	AbandonResult	m	[ ]	m	[ ]		

A.6.3.6 *ChainedList Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.6.1	ChainingArgument	m	[ ]	m	[ ]		§ A.6.3.21 § 14 (Rec. X.518)
A.6.3.6.2	ListArgument	m	[ ]	m	[ ]		§ 10.1 (Rec. X.511)
A.6.3.6.3	object	m	[ ]	m	[ ]		
A.6.3.6.4	CommonArguments	m	[ ]	m	[ ]		§ A.6.3.13
A.6.3.6.5	ChainingResult	m	[ ]	m	[ ]		
A.6.3.6.6	ListResult	m	[ ]	m	[ ]		
A.6.3.6.7	listInfo	m	[ ]	m	[ ]		
A.6.3.6.8	DistinguishedName	m	[ ]	m	[ ]		
A.6.3.6.9	subordinates	m	[ ]	m	[ ]		
A.6.3.6.10	RDN	m	[ ]	m	[ ]		
A.6.3.6.11	aliasEntry	m	[ ]	m	[ ]	d(false)	
A.6.3.6.12	fromEntry	m	[ ]	m	[ ]	d(true)	
A.6.3.6.13	partialOutcomeQualifier	m	[ ]	m	[ ]		
A.6.3.6.14	limitProblem	m	[ ]	m	[ ]		
A.6.3.6.15	unexplored	m	[ ]	m	[ ]		§ A.6.3.20
A.6.3.6.16	unavailableCriticalExt	m	[ ]	m	[ ]	d(false)	
A.6.3.6.17	CommonResults	m	[ ]	m	[ ]		§ A.6.3.14
A.6.3.6.18	uncorrelatedListInfo	m	[ ]	m	[ ]		item A.6.3.6.6

A.6.3.7 *ChainedSearch Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.7.1	ChainingArgument	m	[ ]	m	[ ]		§ A.6.3.21 § 14 (Rec. X.518)
A.6.3.7.2	SearchArgument	m	[ ]	m	[ ]		§ 10.2 (Rec. X.511)
A.6.3.7.3	baseObject	m	[ ]	m	[ ]		
A.6.3.7.4	subset	m	[ ]	m	[ ]	d(0)	
A.6.3.7.5	filter	m	[ ]	m	[ ]	d({ })	§ A.6.3.18
A.6.3.7.6	searchAliases	m	[ ]	m	[ ]	d(True)	
A.6.3.7.7	selection	m	[ ]	m	[ ]	d({ })	§ A.6.3.16
A.6.3.7.8	CommonArguments	m	[ ]	m	[ ]		§ A.6.3.13
A.6.3.7.9	ChainingResult	m	[ ]	m	[ ]		§ A.6.3.22
A.6.3.7.10	SearchResult	m	[ ]	m	[ ]		§ 10.2 (Rec. X.511)
A.6.3.7.11	searchInfo	m	[ ]	m	[ ]		
A.6.3.7.12	DistinguishedName	m	[ ]	m	[ ]		
A.6.3.7.13	entries	m	[ ]	m	[ ]		§ A.6.3.17
A.6.3.7.14	partialOutcomQuaf	m	[ ]	m	[ ]		
A.6.3.7.15	limitProblem	m	[ ]	m	[ ]		
A.6.3.7.16	unexplored	m	[ ]	m	[ ]		§ A.6.3.20
A.6.3.7.17	CommonResults	m	[ ]	m	[ ]		§ A.6.3.14
A.6.3.7.18	uncorrelatedSearchInfo	m	[ ]	m	[ ]		item A.6.3.7.10

A.6.3.8 *ChainedAddEntry Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.8.1	ChainingArgument	m	[ ]	m	[ ]		§ A.6.3.22 § 14 (Rec. X.518)
A.6.3.8.2	AddEntryArgument	m	[ ]	m	[ ]		§ 11.1 (Rec. X.511)
A.6.3.8.3	object	m	[ ]	m	[ ]		
A.6.3.8.4	entry	m	[ ]	m	[ ]		§ A.6.3.17
A.6.3.8.5	CommonArguments	m	[ ]	m	[ ]		§ A.6.3.13
A.6.3.8.6	ChainingResult	m	[ ]	m	[ ]		§ A.6.3.22
A.6.3.8.7	AddEntryResult	m	[ ]	m	[ ]		§ 11.1 (Rec. X.511)

A.6.3.9 *ChainedRemoveEntry Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.9.1	ChainingArgument	m	[ ]	m	[ ]		§ A.6.3.21 § 14 (Rec. X.518)
A.6.3.9.2	RemoveEntryArgument	m	[ ]	m	[ ]		§ 11.2 (Rec. X.511)
A.6.3.9.3	object	m	[ ]	m	[ ]		
A.6.3.9.4	CommonArguments	m	[ ]	m	[ ]		§ A.6.3.13
A.6.3.9.5	ChainingResult	m	[ ]	m	[ ]		§ A.6.3.22
A.6.3.9.6	RemoveEntryResult	m	[ ]	m	[ ]		

A.6.3.10 *ChainedModifyEntry Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.10.1	ChainingArgument	m	[ ]	m	[ ]		§ A.6.3.21 § 14 (Rec. X.518)
A.6.3.10.2	ModifyEntryArgument	m	[ ]	m	[ ]		§ 11.3 (Rec. X.511)
A.6.3.10.3	object	m	[ ]	m	[ ]		
A.6.3.10.4	changes	m	[ ]	m	[ ]		
A.6.3.10.5	addAttribute	m	[ ]	m	[ ]		
A.6.3.10.6	removeAttribute	m	[ ]	m	[ ]		
A.6.3.10.7	addValues	m	[ ]	m	[ ]		
A.6.3.10.8	removeValues	m	[ ]	m	[ ]		
A.6.3.10.9	CommonArguments	m	[ ]	m	[ ]		§ A.6.3.13
A.6.3.10.10	ChainingResult	m	[ ]	m	[ ]		§ A.6.3.22
A.6.3.10.11	ModifyEntryResult	m	[ ]	m	[ ]		§ 11.3 (Rec. X.511)

A.6.3.11 *ChainedModifyRDN Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.11.1	ChainingArgument	m	[ ]	m	[ ]		§ A.6.3.21 § 14 (Rec. X.518)
A.6.3.11.2	ModifyRDNArgument	m	[ ]	m	[ ]		§ 11.4 (Rec. X.511)
A.6.3.11.3	object	m	[ ]	m	[ ]		
A.6.3.11.4	newRDN	m	[ ]	m	[ ]		
A.6.3.11.5	deleteOldRDN	m	[ ]	m	[ ]	d(false)	
A.6.3.11.6	CommonArguments	m	[ ]	m	[ ]		§ A.6.3.13
A.6.3.11.7	ChainingResult	m	[ ]	m	[ ]		§ A.6.3.22
A.6.3.11.8	ModifyRDNResult	m	[ ]	m	[ ]		§ 11.4 (Rec. X.511)

A.6.3.12 *Errors and Parameters*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.12.1	Abandoned	m	[ ]	m	[ ]		§ 12.2 (Rec. X.511)
A.6.3.12.2	AbandonFailed	m	[ ]	m	[ ]		§ 12.3 (Rec. X.511)
A.6.3.12.3	problem	m	[ ]	m	[ ]		
A.6.3.12.4	operation	m	[ ]	m	[ ]		
A.6.3.12.5	AttributeError	m	[ ]	m	[ ]		§ 12.4 (Rec. X.511)
A.6.3.12.6	object	m	[ ]	m	[ ]		
A.6.3.12.7	problems	m	[ ]	m	[ ]		
A.6.3.12.8	problem	m	[ ]	m	[ ]		
A.6.3.12.9	type	m	[ ]	m	[ ]		
A.6.3.12.10	value	m	[ ]	m	[ ]		
A.6.3.12.11	NameError	m	[ ]	m	[ ]		§ 12.5 (Rec. X.511)
A.6.3.12.12	problem	m	[ ]	m	[ ]		
A.6.3.12.13	matched	m	[ ]	m	[ ]		
A.6.3.12.14	DSAReferral	m	[ ]	m	[ ]		§ 15.2 (Rec. X.518)
A.6.3.12.15	continuationReference	m	[ ]	m	[ ]		§ A.6.3.20
A.6.3.12.16	contextPrefix	m	[ ]	m	[ ]		
A.6.3.12.17	traceInformation	m	[ ]	m	[ ]		
A.6.3.12.18	SecurityError	m	[ ]	m	[ ]		§ 12.7 (Rec. X.511)
A.6.3.12.19	problem	m	[ ]	m	[ ]		
A.6.3.12.20	ServiceError	m	[ ]	m	[ ]		§ 12.8 (Rec. X.511)
A.6.3.12.21	problem	m	[ ]	m	[ ]		
A.6.3.12.22	UpdateError	m	[ ]	m	[ ]		§ 12.9 (Rec. X.511)
A.6.3.12.23	problem	m	[ ]	m	[ ]		

A.6.3.13 *CommonArguments Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.13.1	ServiceControls	m	[ ]	m	[ ]	d({ })	§ A.6.3.15
A.6.3.13.2	SecurityParameters	c	[ ]	m	[ ]	p12 d({ })	
A.6.3.13.3	certification-path	m	[ ]	m	[ ]		
A.6.3.13.4	name	m	[ ]	m	[ ]		
A.6.3.13.5	time	o	[ ]	m	[ ]		
A.6.3.13.6	random	o	[ ]	m	[ ]		
A.6.3.13.7	target	m	[ ]	—	—		
A.6.3.13.8	requestor	m	[ ]	m	[ ]		
A.6.3.13.9	OperationProgress	m	[ ]	m	[ ]	d(not Started)	
A.6.3.13.10	nameResolutionPhase	m	[ ]	m	[ ]		
A.6.3.13.11	nextRDNToBeResolved	m	[ ]	m	[ ]		
A.6.3.13.12	aliasedRDNs	m	[ ]	m	[ ]		
A.6.3.13.13	extensions	o	[ ]	m	[ ]		

A.6.3.14 *CommonResults Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.14.1	SecurityParameters	c	[ ]	m	[ ]	p12	
A.6.3.14.2	certification-path	m	[ ]	m	[ ]		
A.6.3.14.3	name	m	[ ]	m	[ ]		
A.6.3.14.4	time	o	[ ]	m	[ ]		
A.6.3.14.5	random	o	[ ]	m	[ ]		
A.6.3.14.6	target	—	—	—	—		
A.6.3.14.7	performer	m	[ ]	m	[ ]		
A.6.3.14.8	aliasDereferenced	m	[ ]	m	[ ]		

A.6.3.15 *Service Controls*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.15.1	options	m	[ ]	m	[ ]	d({ })	§ 7.5 (Rec. X.511)
A.6.3.15.2	priority	m	[ ]	m	[ ]	d(medium)	
A.6.3.15.3	timeLimit	m	[ ]	m	[ ]		
A.6.3.15.4	sizeLimit	m	[ ]	m	[ ]		
A.6.3.15.5	scopeOfReferral	m	[ ]	m	[ ]		

A.6.3.16 *Entry Information Selection*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.16.1	attributeTypes	m	[ ]	m	[ ]		§ 7.6 (Rec. X.511)
A.6.3.16.2	allAttributes	m	[ ]	m	[ ]		
A.6.3.16.3	select	m	[ ]	m	[ ]		
A.6.3.16.4	infoTypes	m	[ ]	m	[ ]		

A.6.3.17 *Entry Information*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.17.1	DistinguishedName	m	[ ]	m	[ ]		§ 7.7 (Rec. X.511)
A.6.3.17.2	fromEntry	m	[ ]	m	[ ]	d(True)	
A.6.3.17.3	<attributeset>	m	[ ]	m	[ ]	(Note)	
A.6.3.17.4	AttributeType	m	[ ]	m	[ ]		
A.6.3.17.5	Attribute	m	[ ]	m	[ ]		

Note – the <attributeset> denotes the SET OF CHOICE ASN.1 construction.

A.6.3.18 *Filter Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.18.1	item	m	[ ]	m	[ ]		§ A.6.3.19
A.6.3.18.2	and	m	[ ]	m	[ ]		
A.6.3.18.3	or	m	[ ]	m	[ ]		
A.6.3.18.4	not	m	[ ]	m	[ ]		

A.6.3.19 *Filter item Elements*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.19.1	equality	m	[ ]	m	[ ]		
A.6.3.19.2	substrings	m	[ ]	m	[ ]		
A.6.3.19.3	type	m	[ ]	m	[ ]		
A.6.3.19.4	strings	m	[ ]	m	[ ]		
A.6.3.19.5	initial	m	[ ]	m	[ ]		
A.6.3.19.6	any	m	[ ]	m	[ ]		
A.6.3.19.7	final	m	[ ]	m	[ ]		
A.6.3.19.8	greaterOrEqual	m	[ ]	m	[ ]		
A.6.3.19.9	lessOrEqual	m	[ ]	m	[ ]		
A.6.3.19.10	present	m	[ ]	m	[ ]		
A.6.3.19.11	approximateMatch	m	[ ]	m	[ ]		

A.6.3.20 *Continuation Reference*

Item	Protocol Element	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.20.1	targetObject	m	[ ]	m	[ ]		
A.6.3.20.2	aliasedRDNs	m	[ ]	m	[ ]		
A.6.3.20.3	OperationProgress	m	[ ]	m	[ ]		
A.6.3.20.4	nameResolutionPhase	m	[ ]	m	[ ]		
A.6.3.20.5	nextRDNToBeResolved	m	[ ]	m	[ ]		
A.6.3.20.6	rdnsResolved	m	[ ]	m	[ ]		
A.6.3.20.7	AccessPoint	m	[ ]	m	[ ]		
A.6.3.20.8	Name	m	[ ]	m	[ ]		
A.6.3.20.9	PresentationAddress	m	[ ]	m	[ ]		
A.6.3.20.10	pSelector	m	[ ]	m	[ ]		
A.6.3.20.11	sSelector	m	[ ]	m	[ ]		
A.6.3.20.12	tSelector	m	[ ]	m	[ ]		
A.6.3.20.13	nSelector	m	[ ]	m	[ ]		

A.6.3.21 *Chaining Argument Elements*

Item	Protocol Elements	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.21.1	originator	m	[ ]	m	[ ]		
A.6.3.21.2	targetObject	m	[ ]	m	[ ]		
A.6.3.21.3	operationProgress	m	[ ]	m	[ ]		
A.6.3.21.4	nameResolutionPhase	m	[ ]	m	[ ]		
A.6.3.21.5	nextRDNToBeResolved	m	[ ]	m	[ ]		
A.6.3.21.6	traceInformation	m	[ ]	m	[ ]		§ A.6.3.24
A.6.3.21.7	aliasDereferenced	m	[ ]	m	[ ]		
A.6.3.21.8	aliasedRDNs	m	[ ]	m	[ ]		
A.6.3.21.9	entryOnly	m	[ ]	m	[ ]		
A.6.3.21.10	returnCrossReferences	m	[ ]	m	[ ]		
A.6.3.21.11	referenceType	m	[ ]	m	[ ]		
A.6.3.21.12	DomainInfo	m	[ ]	m	[ ]		
A.6.3.21.13	timeLimit	m	[ ]	m	[ ]		
A.6.3.21.14	SecurityParameters	m	[ ]	m	[ ]		
A.6.3.21.15	certification-path	m	[ ]	m	[ ]		
A.6.3.21.16	name	m	[ ]	m	[ ]		
A.6.3.21.17	time	m	[ ]	m	[ ]		
A.6.3.21.18	random	m	[ ]	m	[ ]		
A.6.3.21.19	target	m	[ ]	m	[ ]		

A.6.3.22 *Chaining Result Elements*

Item	Protocol Elements	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.22.1	Info	m	[ ]	m	[ ]		
A.6.3.22.2	crossReferences	m	[ ]	m	[ ]		§ A.6.3.23
A.6.3.22.3	SecurityParameters	m	[ ]	m	[ ]		item A.6.3.21.12

A.6.3.23 *Cross Reference Elements*

Item	Protocol Elements	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.23.1	contextPrefix	m	[ ]	m	[ ]		
A.6.3.23.2	accessPoint	m	[ ]	m	[ ]		

A.6.3.24 *Trace Information Elements*

Item	Protocol Elements	D (Init)	I (Init)	D (Res)	I (Res)	Note	Reference
A.6.3.24.1	TraceItem	m	[ ]	m	[ ]		
A.6.3.24.2	dSA	m	[ ]	m	[ ]		
A.6.3.24.3	targetObject	m	[ ]	m	[ ]		
A.6.3.24.4	operationProgress	m	[ ]	m	[ ]		
A.6.3.24.5	nameResolutionPhase	m	[ ]	m	[ ]		
A.6.3.24.6	nextRDNToBeResolved	m	[ ]	m	[ ]		

A.6.4 *Directory schema*

A.6.4.1 *Supported Object Classes*

A.6.4.1.1 *Standard Object Classes*

The supplier of the implementation shall indicate, in the following table, the selected object classes defined in Recommendation X.521 for which conformance is claimed.

Item	Object Class	D	I	Note
A.6.4.1.1.1	top	m	[ ]	
A.6.4.1.1.2	alias	m	[ ]	
A.6.4.1.1.3	country	o	[ ]	
A.6.4.1.1.4	locality	o	[ ]	
A.6.4.1.1.5	organization	o	[ ]	
A.6.4.1.1.6	organizationUnit	o	[ ]	
A.6.4.1.1.7	person	o	[ ]	
A.6.4.1.1.8	organizationalPerson	o	[ ]	
A.6.4.1.1.9	organizationalRole	o	[ ]	
A.6.4.1.1.10	groupOfName	o	[ ]	
A.6.4.1.1.11	residentialPerson	o	[ ]	
A.6.4.1.1.12	applicationProcess	o	[ ]	
A.6.4.1.1.13	applicationEntity	o	[ ]	
A.6.4.1.1.14	dSA	m	[ ]	
A.6.4.1.1.15	device	o	[ ]	
A.6.4.1.1.16	strongAuthentificationUser	o	[ ]	
A.6.4.1.1.17	certificationAuthority	o	[ ]	

A.6.4.1.2 *Other Supported Object Classes*

The supplier is required to list any other object classes provided for which conformance is claimed in this table.

Index	Supported Object Classes

A.6.4.2 *Supported Attribute Types*

A.6.4.2.1 *Standard Attribute Types*

The supplier of the implementation shall indicate, in the following table, the selected attribute types defined in Recommendation X.520 for which conformance is claimed.

Item	Attribute Type	D	I	Upper Bound	Note
A.6.4.2.1.0	objectClass	m	[ ]		
A.6.4.2.1.1	aliasedObjectName	o	[ ]		
A.6.4.2.1.2	knowledgeInformation	o	[ ]		
A.6.4.2.1.3	commonName	o	[ ]	64	
A.6.4.2.1.4	surname	o	[ ]	64	
A.6.4.2.1.5	serialNumber	o	[ ]	64	
A.6.4.2.1.6	countryName	o	[ ]		size = 2
A.6.4.2.1.7	localityName	o	[ ]	128	
A.6.4.2.1.8	stateOrProvinceName	o	[ ]	128	
A.6.4.2.1.9	streetAddress	o	[ ]	128	
A.6.4.2.1.10	organizationName	o	[ ]	64	
A.6.4.2.1.11	organizationalUnitName	o	[ ]	64	
A.6.4.2.1.12	title	o	[ ]	64	
A.6.4.2.1.13	description	o	[ ]	1024	
A.6.4.2.1.14	searchGuide	o	[ ]		
A.6.4.2.1.15	businessCategory	o	[ ]	128	
A.6.4.2.1.16	postalAddress	o	[ ]	6(lines × 30(chs)	
A.6.4.2.1.17	postalCode	o	[ ]	40	
A.6.4.2.1.18	postOfficeBox	o	[ ]	40	
A.6.4.2.1.19	physicalDeliveryOfficeName	o	[ ]	128	
A.6.4.2.1.20	telephoneNumber	o	[ ]	32	
A.6.4.2.1.21	telexNumber	o	[ ]	14, 4, 8	
A.6.4.2.1.22	teletexTerminalIdentifier	o	[ ]	24	
A.6.4.2.1.23	facsimileTelephoneNumber	o	[ ]	32	
A.6.4.2.1.24	x121Address	o	[ ]	15	
A.6.4.2.1.25	internationalISDNNumber	o	[ ]	16	
A.6.4.2.1.26	registeredAddress	o	[ ]	6(lines × 30(chs)	
A.6.4.2.1.27	destinationIndicator	o	[ ]	128	
A.6.4.2.1.28	preferredDeliveryMethod	o	[ ]		
A.6.4.2.1.29	presentationAddress	o	[ ]		
A.6.4.2.1.30	supportedApplicationContext	o	[ ]		
A.6.4.2.1.31	member	o	[ ]		
A.6.4.2.1.32	owner	o	[ ]		
A.6.4.2.1.33	roleOccupant	o	[ ]		
A.6.4.2.1.34	seeAlso	o	[ ]		
A.6.4.2.1.35	userPassword	o	[ ]	128	
A.6.4.2.1.36	userCertificate	o	[ ]		
A.6.4.2.1.37	cACertificate	o	[ ]		
A.6.4.2.1.38	authorityRevocationList	o	[ ]		
A.6.4.2.1.39	certificateRevocationList	o	[ ]		
A.6.4.2.1.40	crossCertificatePair	o	[ ]		

A.6.4.2.2 *Other Supported Attribute Types*

The supplier of the implementation shall list any other attribute types provided for which conformance is claimed in this table.

Index	Attribute Types

A.6.5 *Other information*

This table can be used to provide any other relevant information.

Index	Other information

A.7 *Multi-layer dependencies*

A.7.1 *Upper layers*

Not Applicable.

A.7.2 *Underlying layers*

The Directory System Protocol is defined in the Directory System Application Context that implies the modifications shown in the following tables to the referenced elements within the appropriate PICS Proforma.

A.7.2.1 *ROSE* (Recommendation X.249)

PICS reference	DSA
A.2.2	N/A
A.3.2	N/A
A.14.2	N/A
A.15.2	N/A

A.7.2.2 ACSE (ISO/IEC DIS 8650-2)

PICS reference	DSA
A.7.1	m
A.7.2	N/A
A.8.1	m
A.8.2	m