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Information technology — Open Systems Interconnection — The Directory: Directory Access Protocol — Protocol Implementation Conformance Statement (PICS) proforma

Technologies de l'information — Interconnexion de systèmes ouverts (OSI) — L'annuaire: Protocole d'accès à l'annuaire — Formulaire de déclaration de conformité d'une instance de protocole (PICS)

Contents

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 14608-1 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.581.

ISO/IEC 14608 consists of the following parts, under the general title *Information technology — Open Systems Interconnection — The Directory*:

—   *Part 1: Directory Access Protocol — Protocol Implementation Conformance Statement (PICS) proforma*

—   *Part 2: Directory System Protocol — Protocol Implementation Conformance Statement (PICS) proforma*

Annex A forms an integral part of this part of ISO/IEC 14608.

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INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – THE DIRECTORY: DIRECTORY ACCESS PROTOCOL – PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS) PROFORMA

1   Scope

This Recommendation I International Standard provides the Protocol Implementation Conformance Statement (PICS) proforma for the Directory Access Protocol (DAP) specified in the 1988 CCITT Rec. X.500-Series I ISO/IEC 9594:1990. This PICS proforma is in compliance with the relevant requirements, and in accordance with the relevant guidance given in ITU-T Rec. X.296 I ISO/IEC 9646-7. Detail of the use of this proforma is provided in this Recommendation I International Standard.

The supplier of an implementation which is claimed to conform to CCITT Rec. X.500-Series I ISO/IEC 9594 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.

This PICS proforma applies to either a Directory User Agent (DUA) or a Directory System Agent (DSA), but not both.

2   Normative references

The following Recommendations I International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation I 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 I International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed 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 I International Standards

–   ITU-T Recommendation X.200 (1994) I ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model.*

–   ITU-T Recommendation X.247 (1994) I ISO/IEC 8650-2:1995, *Information technology – Open Systems Interconnection – Protocol specification for the Association Control Service Element: Protocol Implementation Conformance Statement (PICS) proforma.*

–   ITU-T Recommendation X.249[1] I ISO/IEC 9072-4 ...[1], *Information technology – Open Systems Interconnection – Remote Operations: Protocol Implementation Conformance Statement (PICS) proforma.*

2.2   Paired Recommendations I International Standards equivalent in technical content

–   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.*

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[1] To be published.

ISO/IEC 9646-7:1995, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements.*

– CCITT Recommendation X.500 (1988), *The Directory – Overview of concepts, models and services.*

ISO/IEC 9594-1:1990, *Information technology – Open Systems Interconnection – The Directory – Part 1: Overview of concepts, models and services.*

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

ISO/IEC 9594-2:1990, *Information technology – Open Systems Interconnection – The Directory – Part 2: Models.*

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

ISO/IEC 9594-8:1990, *Information technology– Open Systems Interconnection – The Directory – Part 8: Authentication framework.*

– CCITT Recommendation X.511 (1988), *The Directory – Abstract service definition.*

ISO/IEC 9594-3:1990, *Information technology – Open Systems Interconnection – The Directory – Part 3: Abstract service definition.*

– CCITT Recommendation X.518 (1988), *The Directory – Procedures for distributed operation.*

ISO/IEC 9594-4:1990, *Information technology– Open Systems Interconnection – The Directory – Part 4: Procedures for distributed operation.*

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

ISO/IEC 9594-5:1990, *Information technology – Open Systems Interconnection – The Directory – Part 5: Protocol specifications.*

– CCITT Recommendation X.520 (1988), *The Directory – Selected attribute types.*

ISO/IEC 9594-6:1990, *Information technology – Open Systems Interconnection – The Directory – Part 6: Selected attribute types.*

– CCITT Recommendation X.521 (1988), *The Directory – Selected object classes.*

ISO/IEC 9594-7:1990, *Information technology – Open Systems Interconnection – The Directory – Part 7: Selected object classes.*

3 Definitions

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

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

a) Implementation conformance statement;

b) Implementation conformance statement proforma;

c) Protocol Implementation Conformation Statement (PICS); and

d) PICS proforma.

Additional terms:

a) *Centralized DSA:* A DSA that has no knowledge of other DSAs.

b) *Standalone DSA:* A DSA that cannot use the Directory System Protocol, but has knowledge of other DSAs. Such DSAs use the referral procedure only.

c) *Cooperating DSA:* A DSA that has the capability of using the Directory System Protocol.

4 Abbreviations

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

DAP   Directory Access Protocol

DSA   Directory System Agent

DUA   Directory User Agent

ICS   Implementation Conformance Statement

PICS   Protocol Implementation Conformance Statement

5   Conformance

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

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

    a)   describe an implementation which conforms to CCITT Rec. X.500-Series I ISO/IEC 9594;

    b)   be a confirming 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

PICS proforma for the directory access protocol[2]
(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 the table below.

Item	ITU-T Rec. X.581 (1995)	ISO/IEC 14608-1:1996
1	Corr:
2	Corr:
3	Corr:
4	Implementors' Guide version:

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 CCITT Rec. X.500-Series | ISO/IEC 9594 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.

Subclauses 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.

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 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 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 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 of 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.2.2.3 Status column

The 'Status' column indicates the level of support required for conformance to CCITT Rec. X.500-Series | ISO/IEC 9594. The values are as follows:

'm' The item is mandatory. The capability is required to be implemented.

'o' The item is optional. The capability may be implemented.

'o.n' The item is a mutually exclusive or selectable option among a set (where n is the number which identifies the group of optional items). The requirement for each numbered group is specified as part of the relevant tables.

'c' The item is conditional. The requirement on the capability depends on the selections of other optional or conditional items. The status (mandatory, optional, prohibited, or non-applicable) depends on the evaluation of a conditional expression which is specified as part of the relevant tables.

'cn' The item is conditional (where n is the number which identifies the condition which is applicable). The definitions for conditional statements are given as part of the relevant tables.

'x' The item is prohibited or excluded. There is a requirement not to use this capability in the given context.

'n/a' The item is not applicable. The capability is not applicable in the given context.

A.2.2.4 Support column

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

'Y' Yes, the capability is implemented in conformance with CCITT Rec. X.500-Series | ISO/IEC 9594.

'N' No, the capability is not implemented.

'–' No answer is required – it is unnecessary to answer the question with a yes or a no because the question has a status value of non-applicable.

A.2.2.5 Definition of support

A capability is said to be supported if the implementation is able:

- to generate the corresponding operation parameters (either automatically or because the end user requires that capability explicitly);

- to interpret, handle and when required make available to the end user the corresponding error or result.

A protocol element is said to be supported for a sending implementation if the implementation is able to generate it under some circumstances (either automatically or because the end user 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 end user.

An object class is said to be supported if the implementation 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 DUA implementation if the DUA supports those aspects of the attribute syntax which are pertinent to encoding, decoding or both of the attribute.

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.2.2.6 Note column

This column indicates the following:

n   Refers to Note n.

d(n)   A default value n within ( ) is defined in the Recommendation | International Standard. When absent in the PDU, both sender and receiver shall interpret it as having the default value specified in the Recommendation | International Standard.

A.2.2.7 Abbreviations

ACSE   Association Control Service Element

PDU   Protocol Data Unit

ROSE   Remote Operations Service Element

v1988   The 1988 version of the Specification

X.511   CCITT Recommendation X.511 and ISO/IEC 9594-3

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)

A.3.2 Identification of the implementation and/or system

Item	Question	Response
1	Implementation Name	
2	Version Number	
3	Machine Name	
4	Machine Version Number	
5	Operating System Name	
6	Operating System Version Number	
7	Special Configuration (Note)	
8	Other Information	

NOTE – Enter one or more of the following configurations:
- DUA for connection to centralized DSAs;
- DUA for connection to either standalone or cooperating DSAs;
- Centralized DSA;
- Standalone DSA;
- Cooperating DSA;
- First-level DSA.

A.3.3 Identification of the system supplier and/or test laboratory client

Item	Question	Response
1	Organization Name	
2	Contact Name(s)	
3	Address	
4	Telephone Number	
5	Fax Number	
6	Telex Number	
7	E-Mail Address	
8	Other Information	

A.4 Protocol identification

A.4.1 CCITT Rec. X.500-Series | ISO/IEC 9594 protocol specifications and amendments implemented

Item	Identification of Protocol Specification	Support
–	CCITT Rec. X.500-Series (1988)	ISO/IEC 9594:1990	
1	Amd:	
2	Amd:	
3	Amd:	
4	Amd:	
5	Amd:	

A.4.2   CCITT Rec. X.500-Series I ISO/IEC 9594 technical corrigenda implemented

Item	CCITT Rec. X.500-Series (1988) I ISO/IEC 9594:1990	Support
1	Corr:	
2	Corr:	
3	Corr:	
4	Corr:	
5	Corr:	
6	Implementors' Guide version:	

A.5   Global statement of conformance

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 CCITT Rec. X.500-Series I ISO/IEC 9594.

A.5.1   DSA implementation and/or system

Answer if the implementation is a DSA.

Item	Question	Status	Support	Notes
1	Are all mandatory general capabilities for the DSA implemented?	m		
2	Are minimum knowledge requirements (X.518) implemented?	c		1
3	Are all mandatory First-level DSA requirements (X.518) implemented?	c		2
4	Is Cross Reference implemented?	o		
5	Is NSSR (non-specific subordinate reference) implemented?	o		
6	Supported Security Level(s)	None, simple, strong		
7	Is asynchronous (ROSE class 2) mode of operation supported?	m		
8	Is the alias mechanism implemented?	o		
NOTES 1 This item is mandatory unless the special configuration in A.3.2/7 is a centralized DSA. 2 This item is mandatory if the special configuration in A.3.2/7 indicates the DSA acting as a First-level DSA.				

A.5.2   DUA implementation and/or system

Answer if the implementation is a DUA.

Item	Question	Status	Support	Notes
1	Are all mandatory general capabilities for the DUA implemented?	m		
2	Supported Security Level(s)	None, simple, strong		
3	Is asynchronous (ROSE class 2) mode of operation supported?	o		

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 are identified.

A.6.1   Supported application context

The only application context supported by this PICS proforma is Directory Access application context.

A.6.2   Operations

Item	Operation	Status (DUA)	Status (DSA)	Support	Notes	References
1	Directory Bind	m	m			A.6.3.1
2	Directory Unbind	m	m			A.6.3.2
3	Read	o	m		1, 2	A.6.3.3
4	Compare	o	m		1	A.6.3.4
5	Abandon	o	m		3	A.6.3.5
6	List	o	m		1, 2	A.6.3.6
7	Search	o	m		1, 2	A.6.3.7
8	AddEntry	o	m		1	A.6.3.8
9	RemoveEntry	o	m		1	A.6.3.9
10	ModifyEntry	o	m		1	A.6.3.10
11	ModifyRDN	o	m		1	A.6.3.11

NOTES

1   This Note applies to the DUA implementation only. If the supported security level in A.5.2/2 indicates 'strong', then conformance requires support of the signed form of the arguments for the operation.

2   This Note applies to the DSA implementation only. If the supported security level in A.5.1/6 indicates 'strong', then conformance requires support for the signed form of the results for the operation.

3   The Abandon operation can only be supported if the asynchronous mode (ROSE class 2) of operation is supported in A.5.1/7 or A.5.2/3.

A.6.3   Protocol elements

A.6.3.1   DirectoryBind Protocol Elements

A.6.3.1.1   DirectoryBind Arguments

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	DirectoryBindArg	m	m			(X.511) 8.1
2	credentials	c1	c1			
3	simple	c2	c2			
4	name	m	m			
5	validity	o	o			
6	password	o	o			
7	strong	c3	c3			
8	externalProcedure	o	o			
9	versions	m	m		d(v1988)	

c1:   if the supported security level in A.5.2/2 is either 'simple' or 'strong' then m else o.

c2:   if the supported security level in A.5.2/2 is 'simple' then m else o.

c3:   if the supported security level (for a DSA in A.5.1/6 and for a DUA in A.5.2/2) is 'strong' then m else o.

A.6.3.1.2   DirectoryBind Result

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	Directory BindResult	m	m			(X.511) 8.1
2	credentials	c1	c1			
3	simple	c2	c2			
4	name	m	m			
5	validity	o	o			
6	password	o	o			
7	strong	c3	c3			
8	externalProcedure	o	o			
9	versions	m	m		d(v1988)	
c1:	if the supported security level (for a DSA in A.5.1/6 and for a DUA in A.5.2/2) is either 'simple' or 'strong' then m else o.					
c2:	if the supported security level (for a DSA in A.5.1/6 and for a DUA in A.5.2/2) is 'simple' then m else o.					
c3:	if the supported security level (for a DSA in A.5.1/6 and for a DUA in A.5.2/2) is 'strong' then m else o.					

A.6.3.1.3   DirectoryBindError

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	Directory BindError	m	m			(X.511) 8.1
2	versions	m	m		d(v1988)	
3	ServiceProblem	m	m			
4	SecurityProblem	m	m			

A.6.3.2   DirectoryUnbind Elements

DirectoryUnbind has no arguments (see 8.2/X.511).

A.6.3.3   Read Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	ReadArgument	m	m			(X.511) 9.1
2	object	m	m			
3	selection	m	m			A.6.3.16
4	CommonArguments	o	m			A.6.3.13
5	ReadResult	m	m			
6	entry	m	m			A.6.3.17
7	CommonResults	m	m			A.6.3.14

A.6.3.4 Compare Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	CompareArgument	m	m			(X.511) 9.2
2	object	m	m			
3	purported	m	m			
4	CommonArguments	o	m			A.6.3.13
5	CompareResult	m	m			(X.511) 9.2
6	DistinguishedName	m	m			
7	matched	m	m			
8	fromEntry	m	m		d(true)	
9	CommonResults	m	m			A.6.3.14

A.6.3.5 Abandon Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	AbandonArgument	m	m			(X.511) 9.3
2	invoked	m	m			
3	AbandonResult	m	m			

A.6.3.6 List Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	ListArgument	m	m			(X.511) 10.1
2	object	m	m			
3	CommonArguments	o	m			A.6.3.13
4	ListResult	m	m			
5	listInfo	m	m			
6	DistinguishedName	o	m			
7	subordinates	m	m			
8	RDN	m	m			
9	aliasEntry	m	m		d(false)	
10	fromEntry	m	m		d(true)	
11	partialOutcomeQualifier	o	m			
12	limitProblem	o	o			
13	unexplored	o	c1			A.6.3.20
14	unavailableCriticalExt	m	m			
15	CommonResults	m	m			A.6.3.14
16	uncorrelatedListInfo	o	c2			A.6.3.6/4

c1: if A.3.2/7 indicates that the DSA is a cooperating DSA then m else o.
c2: if the supported security level in A.5.1/6 is 'strong' then m else o.

A.6.3.7 Search Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	SearchArgument	m	m			(X.511) 10.2
2	baseObject	m	m			
3	subset	m	m		d(0)	
4	filter	o	m		d(and{})	A.6.3.8
5	searchAliases	m	m		d(true)	
6	selection	o	m		d({})	A.6.3.16
7	CommonArguments	o	m			A.6.3.13
8	SearchResult	m	m			(X.511) 10.2
9	searchInfo	m	m			
10	DistinguishedName	o	m			
11	entries	m	m			A.6.3.17
12	PartialOutcomQuaf	o	m			A.6.3.6/11
13	CommonResults	m	m			A.6.3.14
14	uncorrelatedSearchInfo	o	c1			A.6.3.7/8

c1:   if the supported security level in A.5.1/6 is 'strong' then m else o.

A.6.3.8 AddEntry Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	AddEntryArgument	m	m			(X.511) 11.1
2	object	m	m			
3	entry	m	m			A.6.3.17
4	CommonArguments	o	m			A.6.3.13
5	AddEntryResult	m	m			(X.511) 11.1

A.6.3.9 RemoveEntry Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	RemoveEntryArgument	m	m			(X.511) 11.2
2	object	m	m			
3	CommonArguments	o	m			A.6.3.13
4	RemoveEntryResult	m	m			

A.6.3.10 ModifyEntry Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	ModifyEntryArgument	m	m			(X.511) 11.3
2	object	m	m			
3	changes	m	m			
4	addAttribute	m	m			
5	removeAttribute	m	m			
6	addValues	m	m			
7	removeValues	m	m			
8	CommonArguments	o	m			A.6.3.13
9	ModifyEntryResult	m	m			(X.511) 11.3

A.6.3.11 ModifyRDN Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	ModifyRDNArgument	m	m			(X.511) 11.4
2	object	m	m			
3	newRDN	m	m			
4	deleteOldRDN	m	m		d(false)	
5	CommonArguments	o	m			A.6.3.13
6	ModifyRDNResult	m	m			(X.511) 11.4

A.6.3.12 Errors and Parameters

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	Abandoned	c1	m			(X.511) 12.2
2	AbandonFailed	c1	m			(X.511) 12.3
3	problem	m	m			
4	operation	m	m			
5	AttributeError	c2	m			(X.511) 12.4
6	object	m	m			
7	problems	m	m			
8	problem	m	m			
9	type	m	m			
10	value	m	m			
11	NameError	c3	m			(X.511) 12.5
12	problem	m	m			
13	matched	m	m			
14	Referral	c3	m			(X.511) 12.6
15	candidate	m	m			A.6.3.20
16	SecurityError	c3	m			(X.511) 12.7
17	problem	m	m			
18	ServiceError	c3	m			(X.511) 12.8
19	problem	m	m			
20	UpdateError	c4	m			(X.511) 12.9
21	problem	m	m			

c1: if the Abandon operation is implemented (see A.6.2/5) then m else o.

c2: if at least one of the following operations is implemented (see A.6.2, items 3, 4, 7, 8 or 10):
Read/Compare/ Search/AddEntry/ModifyEntry then m else o.

c3: if at least one of the following operations is implemented (see A.6.2, items 3, 4, 7, 8, 10 or 11):
Read/Compare/ List/Search/AddEntry/ModifyEntry/ModifyRDN then m else o.

c4: if at least one of the following operations is implemented (see A.6.2, items 8, 10 or 11):
AddEntry/RemoveEntry/ModifyEntry/ModifyRDN then m else o.

A.6.3.13 CommonArguments Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	ServiceControls	o	m		d({})	A.6.3.15
2	SecurityParameters	o	c1		d({})	
3	certification-path	o	m			
4	name	o	m			
5	time	o	m			
6	random	o	m			
7	target	o	o			
8	requestor	o	m			
9	OperationProgress	o	m		d(notStarted)	
10	nameResolutionPhase	o	m		d(notStarted)	
11	nextRDNToBeResolved	o	m			
12	aliasedRDNs	o	m			
13	extensions	o	m			

c1: if the supported security level in A.5.1/6 is 'strong' then m else o.

A.6.3.14 CommonResults Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	SecurityParameters	c1	c1			
2	certification-path	o	o			
3	name	o	o			
4	time	m	m			
5	random	m	m			
6	target	n/a	n/a	–		
7	performer	m	m			
8	aliasDereferenced	m	m		d(false)	
c1: if the supported security level (for a DSA in A.5.1/6 and for a DUA in A.5.2/2) is 'strong' then m else o.						

A.6.3.15 Service Controls

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	ServiceControls	o	m			(X.511) 7.5
2	options	o	m		d({})	
3	priority	o	m			
4	timeLimit	o	m			
5	sizeLimit	o	m			
6	scopeOfReferral	o	c1			
c1: if A.3.2/7 indicates that the DSA is a cooperating DSA then m else o.						

A.6.3.16 Entry Information Selection

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	EntryInformationSelection	o	m			(X.511) 7.6
2	attributeTypes	o	m			
3	allAttributes	o	m			
4	select	o	m			
5	infoTypes	o	m		d(1)	

A.6.3.17 Entry Information

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	EntryInformation	m	m			(X.511) 7.7
2	DistinguishedName	m	m			
3	fromEntry	m	m		d(True)	
4	<attributeset>	m	m		Note	
5	Attribute Type	m	m			
6	Attribute	m	m			
NOTE – The <attributeset> denotes the SET OF CHOICE ASN.1 construction.						

A.6.3.18 Filter Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	item	o	m			A.6.3.19
2	and	o	m			
3	or	o	m			
4	not	o	m			

A.6.3.19 Filter item Elements

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	equality	o	m			
2	substrings	o	m			
3	type	o	m			
4	strings	o	m			
5	initial	o	m			
6	any	o	m			
7	final	o	m			
7	greaterOrEqual	o	m			
9	lessOrEqual	o	m			
10	present	o	m			
11	approximateMatch	o	m			

A.6.3.20 Continuation reference

Item	Protocol Element	Status (DUA)	Status (DSA)	Support	Notes	References
1	targetObject	o	m			
2	aliasedRDNs	o	m			
3	OperationProgress	o	m			
4	nameResolutionPhase	o	m			
5	nextRDNToBeResolved	o	m			
6	rdnsResolved	o	m			
7	AccessPoint	o	m			
8	Name	o	m			
9	PresentationAddress	o	m			
10	pSelector	o	m			
11	sSelector	o	m			
12	tSelector	o	m			
13	nSelector	o	m			