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CCITT

COMITÉ CONSULTIVO
INTERNACIONAL
TELEGRÁFICO Y TELEFÓNICO

X.582

(09/92)

REDES DE COMUNICACIÓN DE DATOS

PROTOCOLO DE SISTEMA DE DIRECTORIO –

DECLARACIÓN DE CONFORMIDAD DE IMPLEMENTACIÓN DE PROTOCOLO

Recomendación X.582

PREFACIO

El CCITT (Comité Consultivo Internacional Telegráfico y Telefónico) es un órgano permanente de la Unión Internacional de Telecomunicaciones (UIT). Este órgano estudia los aspectos técnicos, de explotación y tarifarios y publica Recomendaciones sobre los mismos, con miras a la normalización de las telecomunicaciones en el plano mundial.

La Asamblea Plenaria del CCITT, que se celebra cada cuatro años, establece los temas que han de estudiarse y aprueba las Recomendaciones preparadas por sus Comisiones de Estudio. La aprobación de Recomendaciones por los miembros del CCITT entre las Asambleas Plenarias de éste es el objeto del procedimiento establecido en la Resolución N.º 2 del CCITT (Melbourne, 1988).

La Recomendación X.582 ha sido preparada por la Comisión de Estudio VII y fue aprobada por el procedimiento de la Resolución N.º 2 el 10 de septiembre de 1992.

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NOTA DEL CCITT

En esta Recomendación, la expresión «Administración» se utiliza para designar, en forma abreviada, tanto una Administración de telecomunicaciones como una empresa privada de explotación reconocida de telecomu-nicaciones.

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INTRODUCCIÓN

Esta Recomendación, junto con las otras de la misma serie, ha sido elaborada para facilitar la interconexión de sistemas de procesamiento de información para la prestación de servicios de directorio. El conjunto de todos estos sistemas, junto con la información de directorio que contienen, puede considerarse como un todo integrado, denominado el *directorio* La información contenida en el directorio, denominada en forma colectiva base de información de directorio (DIB, *directory information base*), se utiliza por lo general para facilitar la comunicación entre, con o sobre objetos tales como entidades de aplicación, personas, terminales y listas de distribución.

El directorio desempeña un papel importante en la interconexión de sistemas abiertos (OSI, *open systems interconnection*), cuyo propósito es permitir, con un mínimo de acuerdos técnicos fuera de las propias normas de interconexión, la interconexión de sistemas de procesamiento de información:

     –   de diferentes fabricantes;

     –   sometidos a gestiones diferentes;

     –   de diferentes grados de complejidad; y

     –   de diferentes fechas de construcción.

Para evaluar la conformidad de una implementación es necesario disponer de una declaración sobre las capacidades y opciones utilizadas para un protocolo OSI. Dicha declaración se denomina declaración de conformidad de implementación de protocolo (PICS, *protocol implementation conformance statement*).

Esta Recomendación especifica el formulario de PICS para el protocolo de sistema de directorio, como se define en las Recomendaciones de la serie X.500 (1988).

Recomendación X.582

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**PROTOCOLO DE SISTEMA DE DIRECTORIO
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(1992)

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1 Alcance

1.1   La presente Recomendación proporciona el formulario de PICS para el protocolo de sistema de directorio (DSP) especificado en las Recomendaciones de la serie X.500 (1988). Este formulario PICS satisface los requisitos y directrices aplicables al formulario PICS especificados en la Norma ISO/CEI 9646-2.

1.2   Los detalles de la utilización de este formulario se proporcionan en el anexo A.

1.3   El objeto de esta Recomendación es la especificación de las declaraciones de conformidad para un agente de sistema de directorio (DSA, *directory system agent*) que coopera.

2 Referencias normativas

–   Recomendación X.500 del CCITT (1988), *La guía – Visión de conjunto de conceptos, modelos y servicios.*

–   Recomendación X.501 del CCITT (1988), *La guía – Modelos.*

–   Recomendación X.509 del CCITT (1988), *La guía – Marco de autenticación.*

–   Recomendación X.511 del CCITT (1988), *La guía – Definición de servicio abstracto.*

–   Recomendación X.518 del CCITT (1988), *La guía – Procedimientos para la operación distribuida.*

–   Recomendación X.519 del CCITT (1988), *La guía – Especificaciones de protocolos.*

–   Recomendación X.520 del CCITT (1988), *La guía – Tipos de atributo seleccionados.*

–   Recomendación X.521 del CCITT (1988), *La guía – Clases de objeto seleccionadas.*

ISO/CEI 9646-1:1991, *Information technology – Open systems interconnection – Conformance testing methodology and framework, Part 1: General concepts.* [Véase también la Recomendación X.290 del CCITT (1992).]

ISO/CEI 9646-2:1991, *Information technology – Open systems interconnection – Conformance testing methodology and framework, Part 2: Abstract test suite specification.* [Véase también la Recomendación X.291 del CCITT (1992).]

3 Definiciones

En la presente Recomendación se utilizan los términos definidos en las Recomendaciones de la serie X.500 del CCITT (1988).

En esta Recomendación se utilizan los siguientes términos definidos en la Norma ISO/CEI 9646:

–   enunciado de conformidad de implementación de protocolo (PICS);

–   formulario de PICS;

–   conformidad;

–   requisito obligatorio;

–   requisito opcional;

–   requisito condicional.

En esta Recomendación se emplea el siguiente término:

DSA cooperante: DSA que tiene la capacidad de utilizar el protocolo de sistema de directorio.

4 Abreviaturas

En la presente Recomendación se utilizan las abreviaturas definidas en las Recomendaciones de la serie X.500 del CCITT (1988).

5 Convenios

El formulario de PICS se designa como un anexo a esta Recomendación.

6 Conformidad

El proveedor de una implementación de protocolo de sistema de directorio que se pretende conforme a las Recomendaciones de la serie X.500 del CCITT (1988), debe rellenar un ejemplar del formulario de PICS proporcionada en el anexo A y suministrar la información necesaria para identificar tanto al proveedor como la implementación.

ANEXO A

(a la Recomendación X.582)

Protocolo de sistema de directorio
Formulario de declaración de conformidad de realización de protocolo

(Este anexo es parte integrante de esta Recomendación)

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

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