UNIÓN INTERNACIONAL DE TELECOMUNICACIONES

CCITT

COMITÉ CONSULTIVO
INTERNACIONAL
TELEGRÁFICO Y TELEFÓNICO

X.581
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REDES DE COMUNICACIÓN DE DATOS

PROTOCOLO DE ACCESO DE DIRECTORIO – DECLARACIÓN DE CONFORMIDAD DE IMPLEMENTACIÓN DE PROTOCOLO

Recomendación X.581

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.581 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 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 diferente 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.581

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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 acceso de directorio (DAP) especificado en las Recomendaciones de la serie X.500 (1988). Este formulario PICS satisface los requisitos y directrices aplicables al formulario de 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 usuario de directorio (DUA, *directory user agent*) y un agente de sistema de directorio (DSA, *directory system agent*). Este formulario puede ser utilizado en relación con una implementación de DUA o de DSA, pero no para ambas.

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 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*.

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

Norma ISO/CEI 9646-2:1991, *Information technology – Open systems interconnection – Conformance testing methodology and framework, Part 2: Abstract test 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 la presente Recomendación se utilizan los siguientes términos definidos en la Norma ISO/CEI 9646:

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

–   formulario PICS;

–   conformidad;

–   requisito obligatorio;

–   requisito opcional;

–   requisito condicional.

En esta Recomendación se emplean los siguientes términos:

- **DSA centralizado**: DSA que no tiene conocimiento de otros DSA.

- **DSA independiente**: DSA que no puede utilizar el protocolo de sistema de directorio, pero tiene conocimiento de otros DSA. Estos DSA utilizan únicamente el modo referimiento.

- **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 PICS se designa como un anexo a esta Recomendación.

6 Conformidad

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

ANEXO A

(a la Recomendación X.581)

**Protocolo de acceso de directorio
Formulario de declaración de conformidad
de implementación de protocolo**

(Este anexo es parte integrante de esta Recomendación)

Comunicado sobre derechos de autor del formulario de PICS:

Los usuarios de esta Recomendación pueden reproducir libremente el formulario de PICS de este anexo a fin de que pueda ser utilizado para las fines previstos, y pueden además publicar el PICS cumplimentado.

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 one or more of the following configurations:
   – DUA for connection to centralized DSAs;
   – DUA for connection to either standalone or co-operating DSAs;
   – Centralized DSAs;
   – Standalone DSAs;
   – Co-operating DSAs;
   – First-level DSAs.

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, No., publication date of the protocol standard	
A.2.2	Protocol Version Number	
A.2.3	Implemented Addenda	
A.2.4	Implemented Defect Reports (Reference No.)	

A.3   *Global statement of conformance*

If the supplied implementation is a DSA implementation, § A.3.1 is required to be answered by the supplier.

If the supplied implementation is a DUA implementation, § A.3.2 is required to be answered by the supplier.

Answering "No" to items A.3.1.1 or A.3.2.1 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".

A.3.1   *DSA implementation and/or system*

Item	Question	D	I
A.3.1.1	Are all mandatory general capabilities for the DSA implemented?	m	[ ]
A.3.1.2	Are minimum knowledge requirements (Rec. X.518) implemented?	c (Note 1)	[ ]
A.3.1.3	Are all mandatory First-level DSA requirements (Rec. X.518) implemented?	c (Note 2)	[ ]
A.3.1.4	Is Cross Reference implemented?	o	[ ]
A.3.1.5	Is NSSR (non-specific subordinate reference) implemented?	o	[ ]
A.3.1.6	Supported Security Level(s)	None, simple, strong	( )
A.3.1.7	Is asynchronous (ROSE class 2) mode of operation supported?	m	[ ]
A.3.1.8	Is the alias mechanism implemented?	o	[ ]

A.3.2   *DUA implementation and/or system – General capabilities*

Item	Question	D	I
A.3.2.1	Are all mandatory general capabilities for the DUA implemented?	m	[ ]
A.3.2.2	Supported Security Level(s)	None, simple, strong	( )
A.3.2.3	Is asynchronous (ROSE class 2) mode of operation supported?	o	[ ]

A.4   *Instruction for completing the PICS Proforma*

A.4.1   *Definition of support*

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 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 it 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 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 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.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.

The D(DUA) indicates that the implementation under the IUT is a DUA and the D(DSA) indicates that the implementation under the IUT is a DSA.

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 been 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 is supported;

S   simple authentication is supported;

N   no authentication is 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 sender and receiver 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 means of uniquely identifying all possible implementation details within the PICS Proforma. This referencing is used both inside the PICS Proforma, and for references from other test specification documents.

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

–   A reference to the smallest 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 DirectoryBind 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 item A3.2.2 indicates either "S" (simple) or "T" (strong);

p11:   true if the supported security level in item A.3.2.2 indicates "S" (simple);

p12:   true for a DSA if the supported security level in item A.3.1.6 indicates "T" (strong); true for a DUA if the supported security level in item A.3.2.2 indicates "T" (strong);

p13:   true for a DSA if the supported security level in item A.3.1.6 indicates either "S"(simple) or "T" (strong); p10 for a DUA;

p14:   true for a DSA if the supported security level in item A.3.1.6 indicates "S" (simple); p11 for a DUA;

p30:   true if item A.1.2.7 indicates that the DSA is a co-operating DSA;

p50:   true for a DUA if the Abandon operation is implemented (see § A.6.2);

p51:   true for a DUA if at least one of the following operations is implemented (see § A.6.2): Read/Compare/Search/AddEntry/ModifyEntry;

p52:   true for a DUA if at least one of the following operations is implemented (see § A.6.2): Read/Compare/List/Search/AddEntry/RemoveEntry/ModifyEntry/ModifyRDN;

p53:   true for a DUA if at least one of the following operations is implemented (see § A.6.2); AddEntry/RemoveEntry/ModifyEntry/ModifyRDN;

p90:   true if the IUT is a DSA.

A.5   *Abbreviations*

The following abbreviations are used in this PICS Proforma:

c   conditional;

D   Defined;

d   default;

I   Implemented;

m   mandatory;

n   no Authentication;

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 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	D (DUA)	D (DSA)	I	Note	Reference
A.6.2.1	Directory Bind	m	m	[ ]		§ A.6.3.1
A.6.2.2	Directory Unbind	m	m	[ ]		§ A.6.3.2
A.6.2.3	Read	o	m	[ ]	(Notes 1, 2)	§ A.6.3.3
A.6.2.4	Compare	o	m	[ ]	(Note 1)	§ A.6.3.4
A.6.2.5	Abandon	o	m	[ ]	(Note 3)	§ A.6.3.5
A.6.2.6	List	o	m	[ ]	(Notes 1, 2)	§ A.6.3.6
A.6.2.7	Search	o	m	[ ]	(Notes 1, 2)	§ A.6.3.7
A.6.2.8	AddEntry	o	m	[ ]	(Note 1)	§ A.6.3.8
A.6.2.9	RemoveEntry	o	m	[ ]	(Note 1)	§ A.6.3.9
A.6.2.10	ModifyEntry	o	m	[ ]	(Note 1)	§ A.6.3.10
A.6.2.11	ModifyRDN	o	m	[ ]	(Note 1)	§ A.6.3.11

Note 1 – This Note applies to the DUA implementation only. If the supported security level in item A.3.2.2 indicates "T" (strong), then conformance requires support of the signed form of the arguments for the operation.

Note 2 – This Note applies to the DSA implementation only. If the supported security level in item A.3.1.6 indicates "T" (strong), then conformance requires support for the signed form of the results for this operation.

Note 3 – If the Abandon operation can only be supported if the asynchronous mode (ROSE class 2) of operation is supported in items A.3.1.7 or A.3.2.3.

A.6.3   *Protocol elements*

A.6.3.1   *DirectoryBind Protocol Elements*

A.6.3.1.1   *DirectoryBind Arguments*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.1.1.1	Directory BindArg	m	m	[ ]		§ 8.1 (Rec. X.511)
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	c	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   *DirectoryBind Result*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.1.2.1	Directory BindResult	m	m	[ ]		§ 8.1 (Rec. X.511)
A.6.3.1.2.2	credentials	c	c	[ ]	p13	
A.6.3.1.2.3	simple	c	c	[ ]	p14	
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   *DirectoryBindError*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.1.3.1	DirectoryBindError	m	m	[ ]		§ 8.1 (Rec. X.511)
A.6.3.1.3.2	versions	m	m	[ ]	d(v1988)	
A.6.3.1.2.3	ServiceProblem	m	m	[ ]		
A.6.3.1.3.4	SecurityProblem	m	m	[ ]		

A.6.3.2   *DirectoryUnbind Elements*

DirectoryUnbind has no arguments (see § 8.2 of Recommendation X.511).

A.6.3.3   *Read Elements*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.3.1	ReadArgument	m	m	[ ]		§ 9.1 (Rec. X.511)
A.6.3.3.2	object	m	m	[ ]		
A.6.3.3.3	selection	m	m	[ ]		§ A.6.3.16
A.6.3.3.4	CommonArguments	o	m	[ ]		§ A.6.3.13
A.6.3.3.5	ReadResult	m	m	[ ]		
A.6.3.3.6	entry	m	m	[ ]		§ A.6.3.17
A.6.3.3.7	CommonResults	m	m	[ ]		§ A.6.3.14

A.6.3.4   *Compare Elements*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.4.1	CompareArgument	m	m	[　]		§ 9.2 (Rec. X.511)
A.6.3.4.2	object	m	m	[　]		
A.6.3.4.3	purported	m	m	[　]		
A.6.3.4.4	CommonArguments	o	m	[　]		§ A.6.3.13
A.6.3.4.5	CompareResult	m	m	[　]		§ 9.2 (Rec. X.511)
A.6.3.4.6	DistinguishedName	m	m	[　]		
A.6.3.4.7	matched	m	m	[　]		
A.6.3.4.8	fromEntry	m	m	[　]	d(true)	
A.6.3.4.9	CommonResults	m	m	[　]		§ A.6.3.14

A.6.3.5   *Abandon Elements*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.5.1	AbandonArgument	m	m	[　]		§ 9.3 (Rec. X.511)
A.6.3.5.2	invoked	m	m	[　]		
A.6.3.5.3	AbandonResult	m	m	[　]		

A.6.3.6   *List Elements*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.6.1	ListArgument	m	m	[　]		§ 10.1 (Rec. X.511)
A.6.3.6.2	object	m	m	[　]		
A.6.3.6.3	CommonArguments	o	m	[　]		§ A.6.3.13
A.6.3.6.4	ListResult	m	m	[　]		
A.6.3.6.5	listInfo	m	m	[　]		
A.6.3.6.6	DistinguishedName	o	m	[　]		
A.6.3.6.7	subordinates	m	m	[　]		
A.6.3.6.8	RDN	m	m	[　]		
A.6.3.6.9	aliasEntry	m	m	[　]	d(false)	
A.6.3.6.10	fromEntry	m	m	[　]	d(true)	
A.6.3.6.11	partialOutcomeQualifier	o	m	[　]		
A.6.3.6.12	limitProblem	o	o	[　]		
A.6.3.6.13	unexplored	o	c	[　]	p30	§ A.6.3.20
A.6.3.6.14	unavailableCriticalExt	m	m	[　]		
A.6.3.6.15	CommonResults	m	m	[　]		§ A.6.3.14
A.6.3.6.16	uncorrelatedListInfo	o	c	[　]	p12	item A.6.3.6.4

A.6.3.7 *Search Elements*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.7.1	SearchArgument	m	m	[ ]		§ 10.2 (Rec. X.511)
A.6.3.7.2	baseObject	m	m	[ ]		
A.6.3.7.3	subset	m	m	[ ]	d(0)	
A.6.3.7.4	filter	o	m	[ ]	d(and{})	§ A.6.3.8
A.6.3.7.5	searchAliases	m	m	[ ]	d(true)	
A.6.3.7.6	selection	o	m	[ ]	d({})	§ A.6.3.16
A.6.3.7.7	CommonArguments	o	m	[ ]		§ A.6.3.13
A.6.3.7.8	SearchResult	m	m	[ ]		§ 10.2 (Rec. X.511)
A.6.3.7.9	searchInfo	m	m	[ ]		
A.6.3.7.10	DistinguishedName	o	m	[ ]		
A.6.3.7.11	entries	m	m	[ ]		§ A.6.3.17
A.6.3.7.12	PartialOutcomQuaf	o	m	[ ]		Item A.6.3.6.11
A.6.3.7.13	CommonResults	m	m	[ ]		§ A.6.3.14
A.6.3.7.14	uncorrelatedSearchInfo	o	c	[ ]	p12	Item A.6.3.7.8

A.6.3.8 *AddEntry Elements*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.8.1	AddEntryArgument	m	m	[ ]		§ 11.1 (Rec. X.511)
A.6.3.8.2	object	m	m	[ ]		
A.6.3.8.3	entry	m	m	[ ]		§ A.6.3.17
A.6.3.8.4	CommonArguments	o	m	[ ]		§ A.6.3.13
A.6.3.8 5	AddEntryResult	m	m	[ ]		§ 11.1 (Rec. X.511)

A.6.3.9 *RemoveEntry Elements*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.9.1	RemoveEntryArgument	m	m	[ ]		§ 11.2 (Rec. X.511)
A.6.3.9.2	object	m	m	[ ]		
A.6.3.9.3	CommonArguments	o	m	[ ]		§ A.6.3.13
A.6.3.9.4	RemoveEntryResult	m	m	[ ]		

A.6.3.10   *ModifyEntry Elements*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.10.1	ModifyEntryArgument	m	m	[ ]		§ 11.3 (Rec. X.511)
A.6.3.10.2	object	m	m	[ ]		
A.6.3.10.3	changes	m	m	[ ]		
A.6.3.10.4	addAttribute	m	m	[ ]		
A.6.3.10.5	removeAttribute	m	m	[ ]		
A.6.3.10.6	addValues	m	m	[ ]		
A.6.3.10.7	removeValues	m	m	[ ]		
A.6.3.10.8	CommonArguments	o	m	[ ]		§ A.6.3.13
A.6.3.10.9	ModifyEntryResult	m	m	[ ]		§ 11.3 (Rec. X.511)

A.6.3.11   *ModifyRDN Elements*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.11.1	ModifyRDNArgument	m	m	[ ]		§ 11.4 (Rec. X.511)
A.6.3.11.2	object	m	m	[ ]		
A.6.3.11.3	newRDN	m	m	[ ]		
A.6.3.11.4	deleteOldRDN	m	m	[ ]	d(false)	
A.6.3.11.5	CommonArguments	o	m	[ ]		§ A.6.3.13
A.6.3.11.6	ModifyRDNResult	m	m	[ ]		§ 11.4 (Rec. X.511)

A.6.3.12 *Errors and Parameters*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.12.1	Abandoned	c	m	[　]	p50	§ 12.2 (Rec. X.511)
A.6.3.12.2	AbandonFailed	c	m	[　]	p50	§ 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	c	m	[　]	p51	§ 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	c	m	[　]	p52	§ 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	Referral	c	m	[　]	p52	§ 12.6 (Rec. X.511)
A.6.3.12.15	candidate	m	m	[　]		§ A.6.3.20
A.6.3.12.16	SecurityError	c	m	[　]	p52	§ 12.7 (Rec. X.511)
A.6.3.12.17	problem	m	m	[　]		
A.6.3.12.18	ServiceError	c	m	[　]	p52	§ 12.8 (Rec. X.511)
A.6.3.12.19	problem	m	m	[　]		
A.6.3.12.20	UpdateError	c	m	[　]	p53	§ 12.9 (Rec. X.511)
A.6.3.12.21	problem	m	m	[　]		

A.6.3.13   *CommonArguments Elements*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.13.1	ServiceControls	o	m	[ ]	d({})	§ A.6.3.15
A.6.3.13.2	SecurityParameters	o	c	[ ]	p12 d({})	
A.6.3.13.3	certification-path	o	m	[ ]		
A.6.3.13.4	name	o	m	[ ]		
A.6.3.13.5	time	o	m	[ ]		
A.6.3.13.6	random	o	m	[ ]		
A.6.3.13.7	target	o	o	[ ]		
A.6.3.13.8	requestor	o	m	[ ]		
A.6.3.13.9	OperationProgress	o	m	[ ]	d(notStarted)	
A.6.3.13.10	nameResolutionPhase	o	m	[ ]	d(notStarted)	
A.6.3.13.11	nextRDNToBeResolved	o	m	[ ]		
A.6.3.13.12	aliasedRDNs	o	m	[ ]		
A.6.3.13.13	extensions	o	m	[ ]		

A.6.3.14   *CommonResults Elements*

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

A.6.3.15   *Service Controls*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.15.1	ServiceControls	o	m	[ ]		§ 7.5 (Rec. X.511)
A.6.3.15.2	options	o	m	[ ]	d({})	
A.6.3.15.3	priority	o	m	[ ]		
A.6.3.15.4	timeLimit	o	m	[ ]		
A.6.3.15.5	sizeLimit	o	m	[ ]		
A.6.3.15.6	scopeOfReferral	o	c	[ ]	p30	

A.6.3.16   *Entry Information Selection*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.16.1	EntryInformationSelection	o	m	[ ]		§ 7.6 (Rec. X.511)
A.6.3.16.2	attributeTypes	o	m	[ ]		
A.6.3.16.3	allAttributes	o	m	[ ]		
A.6.3.16.4	select	o	m	[ ]		
A.6.3.16.5	infoTypes	o	m	[ ]	d(1)	

A.6.3.17   *Entry Information*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.17.1	EntryInformation	m	m	[ ]		§ 7.7 (Rec. X.511)
A.6.3.17.2	DistinguishedName	m	m	[ ]		
A.6.3.17.3	fromEntry	m	m	[ ]	d(True)	
A.6.3.17.4	<attributeset>	m	m	[ ]	(Note 1)	
A.6.3.17.5	AttributeType	m	m	[ ]		
A.6.3.17.6	Attribute	m	m	[ ]		

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

A.6.3.18   *Filter Elements*

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

A.6.3.19   *Filter item Elements*

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

A.6.3.20   *Continuation reference*

Item	Protocol Element	D (DUA)	D (DSA)	I	Note	Reference
A.6.3.20.1	targetObject	o	m	[ ]		
A.6.3.20.2	aliasedRDNs	o	m	[ ]		
A.6.3.20.3	OperationProgress	o	m	[ ]		
A.6.3.20.4	nameResolutionPhase	o	m	[ ]		
A.6.3.20.5	nextRDNToBeResolved	o	m	[ ]		
A.6.3.20.6	rdnsResolved	o	m	[ ]		
A.6.3.20.7	AccessPoint	o	m	[ ]		
A.6.3.20.8	Name	o	m	[ ]		
A.6.3.20.9	PresentationAddress	o	m	[ ]		
A.6.3.20.10	pSelector	o	m	[ ]		
A.6.3.20.11	sSelector	o	m	[ ]		
A.6.3.20.12	tSelector	o	m	[ ]		
A.6.3.20.13	nSelector	o	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 DSA implementation shall indicate, in the table below, the selected object classes defined in Recommendation X.521 for which conformance is claimed. The supplier of the DUA implementation need not complete the following table:

Item	Objet 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	organizationalUnit	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	strongAuthenticationUser	o	[ ]	
A.6.4.1.1.17	certificationAuthority	o	[ ]	

A.6.4.1.2 *Other Supported object classes*

The supplier of the DSA implementation is required to list any other object classes provided for which conformance is claimed in the following 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	c	[ ]		p90
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	physicalDeliveryOfficeNa	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	facsimileTelephoneNumb	o	[ ]	32	
A.6.4.2.1.24	X.121Address	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	supportedApplicationCont	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	

Item	Attribute Type	D	I	Upper bound	Note
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 the following table:

Index	Attribute Types

A.6.5   *Other information*

The following 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 Access Protocol is defined in the Directory Access 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	DUA	DSA
A.2.2	N/A	N/A
A.3.2	N/A	N/A
A.14.2	N/A	N/A
A.15.2	N/A	N/A

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

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