



UNIÓN INTERNACIONAL DE TELECOMUNICACIONES

UIT-T

SECTOR DE NORMALIZACIÓN
DE LAS TELECOMUNICACIONES
DE LA UIT

X.583

(12/97)

SERIE X: REDES DE DATOS Y COMUNICACIÓN
ENTRE SISTEMAS ABIERTOS

Directorio

**Tecnología de la información – Interconexión de
sistemas abiertos – El directorio: Formulario de
enunciado de conformidad de implementación
de protocolo para el protocolo de acceso al
directorio**

Recomendación UIT-T X.583

(Anteriormente Recomendación del CCITT)

RECOMENDACIONES DE LA SERIE X DEL UIT-T

REDES DE DATOS Y COMUNICACIÓN ENTRE SISTEMAS ABIERTOS

REDES PÚBLICAS DE DATOS

Servicios y facilidades	X.1–X.19
Interfaces	X.20–X.49
Transmisión, señalización y conmutación	X.50–X.89
Aspectos de redes	X.90–X.149
Mantenimiento	X.150–X.179
Disposiciones administrativas	X.180–X.199

INTERCONEXIÓN DE SISTEMAS ABIERTOS

Modelo y notación	X.200–X.209
Definiciones de los servicios	X.210–X.219
Especificaciones de los protocolos en modo conexión	X.220–X.229
Especificaciones de los protocolos en modo sin conexión	X.230–X.239
Formularios para declaraciones de conformidad de implementación de protocolo	X.240–X.259
Identificación de protocolos	X.260–X.269
Protocolos de seguridad	X.270–X.279
Objetos gestionados de capa	X.280–X.289
Pruebas de conformidad	X.290–X.299

INTERFUNCIONAMIENTO ENTRE REDES

Generalidades	X.300–X.349
Sistemas de transmisión de datos por satélite	X.350–X.399

SISTEMAS DE TRATAMIENTO DE MENSAJES

X.400–X.499

DIRECTORIO

X.500–X.599

GESTIÓN DE REDES DE INTERCONEXIÓN DE SISTEMAS ABIERTOS Y ASPECTOS DE SISTEMAS

Gestión de redes	X.600–X.629
Eficacia	X.630–X.639
Calidad de servicio	X.640–X.649
Denominación, direccionamiento y registro	X.650–X.679
Notación de sintaxis abstracta uno	X.680–X.699

GESTIÓN DE INTERCONEXIÓN DE SISTEMAS ABIERTOS

Marco y arquitectura de la gestión de sistemas	X.700–X.709
Servicio y protocolo de comunicación de gestión	X.710–X.719
Estructura de la información de gestión	X.720–X.729
Funciones de gestión y funciones de arquitectura de gestión distribuida abierta	X.730–X.799

SEGURIDAD

X.800–X.849

APLICACIONES DE INTERCONEXIÓN DE SISTEMAS ABIERTOS

Compromiso, concurrencia y recuperación	X.850–X.859
Procesamiento de transacciones	X.860–X.879
Operaciones a distancia	X.880–X.899

PROCESAMIENTO DISTRIBUIDO ABIERTO

X.900–X.999

Para más información, véase la Lista de Recomendaciones del UIT-T.

NORMA INTERNACIONAL 13248-1

RECOMENDACIÓN UIT-T X.583

TECNOLOGÍA DE LA INFORMACIÓN – INTERCONEXIÓN DE SISTEMAS ABIERTOS – EL DIRECTORIO: FORMULARIO DE ENUNCIADO DE CONFORMIDAD DE IMPLEMENTACIÓN DE PROTOCOLO PARA EL PROTOCOLO DE ACCESO AL DIRECTORIO

Resumen

Esta Recomendación | Norma Internacional contiene el formulario de PICS para el protocolo de acceso al directorio (DAP), especificado en las Recomendaciones de la serie UIT-T X.500 (1993) | ISO/CEI 9594:1995.

El campo de aplicación de la presente Recomendación | Norma Internacional es la especificación de los enunciados de conformidad de un agente de usuario de directorio (DUA), y un agente de sistema de directorio (DSA).

Orígenes

El texto de la Recomendación UIT-T X.583 se aprobó el 12 de diciembre de 1997. Su texto se publica también, en forma idéntica, como Norma Internacional ISO/CEI 13248-1.

PREFACIO

La UIT (Unión Internacional de Telecomunicaciones) es el organismo especializado de las Naciones Unidas en el campo de las telecomunicaciones. El UIT-T (Sector de Normalización de las Telecomunicaciones de la UIT) es un órgano permanente de la 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 Conferencia Mundial de Normalización de las Telecomunicaciones (CMNT), que se celebra cada cuatro años, establece los temas que han de estudiar las Comisiones de Estudio del UIT-T, que a su vez producen Recomendaciones sobre dichos temas.

La aprobación de Recomendaciones por los Miembros del UIT-T es el objeto del procedimiento establecido en la Resolución N.º 1 de la CMNT.

En ciertos sectores de la tecnología de la información que corresponden a la esfera de competencia del UIT-T, se preparan las normas necesarias en colaboración con la ISO y la CEI.

NOTA

En esta Recomendación, la expresión "Administración" se utiliza para designar, en forma abreviada, tanto una administración de telecomunicaciones como una empresa de explotación reconocida de telecomunicaciones.

PROPIEDAD INTELECTUAL

La UIT señala a la atención la posibilidad de que la utilización o aplicación de la presente Recomendación suponga el empleo de un derecho de propiedad intelectual reivindicado. La UIT no adopta ninguna posición en cuanto a la demostración, validez o aplicabilidad de los derechos de propiedad intelectual reivindicados, ya sea por los miembros de la UIT o por terceros ajenos al proceso de elaboración de Recomendaciones.

En la fecha de aprobación de la presente Recomendación, la UIT no ha recibido notificación de propiedad intelectual, protegida por patente, que puede ser necesaria para aplicar esta Recomendación. Sin embargo, debe señalarse a los usuarios que puede que esta información no se encuentre totalmente actualizada al respecto, por lo que se les insta encarecidamente a consultar la base de datos sobre patentes de la TSB.

© UIT 1998

Es propiedad. Ninguna parte de esta publicación puede reproducirse o utilizarse, de ninguna forma o por ningún medio, sea éste electrónico o mecánico, de fotocopia o de microfilm, sin previa autorización escrita por parte de la UIT, salvo lo indicado en la nota de pie de página 1) del anexo A.

ÍNDICE

	<i>Página</i>
1 Alcance	1
2 Referencias normativas	1
2.1 Recomendaciones Normas Internacionales idénticas.....	1
2.2 Pares de Recomendaciones Normas Internacionales con contenido técnico equivalente.....	2
2.3 Otras referencias	2
3 Definiciones	2
3.1 Definiciones relativas al directorio	2
3.2 Definiciones relativas a la conformidad.....	2
3.3 Definiciones relativas a la conformidad del directorio básico	2
4 Abreviaturas	3
5 Convenios.....	3
6 Conformidad	3
Anexo A – Protocolo de acceso al directorio – Formulario de enunciado de conformidad de implementación de protocolo (PICS)	4
A.1 Identification of the ICS proforma corrigenda	4
A.2 Instructions	4
A.2.1 Purpose and structure of the proforma	4
A.2.2 Symbols, terms, and abbreviations.....	4
A.2.3 Instructions for completing the PICS proforma	6
A.3 Identification of the implementation	7
A.3.1 Identification of PICS	7
A.3.2 Identification of the implementation and/or system.....	7
A.3.3 Identification of the system supplier	7
A.3.4 Identification of the testlab client.....	7
A.4 Identification of the protocol	8
A.5 Identification of corrigenda to the protocol	8
A.6 ICS proforma tables.....	9
A.6.1 Roles	9
A.6.2 General capabilities and global statement of conformance	9
A.6.3 Capabilities and options.....	11
A.6.4 Directory Schema and Directory System Schema.....	32
A.6.5 Supported ISO/IEC 10646-1 Character Sets (Ref. ISO/IEC 10646-1)	42
A.6.6 Other information.....	45

Introducción

Esta Recomendación | Norma Internacional 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 cometido 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 tecnologías.

Para evaluar la conformidad de una implementación es necesario disponer de una declaración sobre las capacidades y opciones utilizadas para un protocolo OSI dado. Dicha declaración se denomina enunciado de conformidad de implementación de protocolo (PICS).

Esta Recomendación | Norma Internacional contiene el formulario de enunciado de conformidad de implementación de protocolo (PICS) para el protocolo de acceso de directorio (DAP), especificado en las Recomendaciones de la serie UIT-T X.500 (1993) | ISO/CEI 9594:1995. Todas las referencias a las especificaciones de directorio hechas, en esta Recomendación | Norma Internacional, son la segunda edición de dichas especificaciones (Recomendaciones de la serie UIT-T X.500 (1993) | ISO/CEI 9594:1995).

En el anexo A se especifica el formulario de PICS para el protocolo de acceso de directorio (DAP) definido en las Recomendaciones de la serie UIT-T X.500 | ISO/CEI 9594.

NORMA INTERNACIONAL

RECOMENDACIÓN UIT-T

**TECNOLOGÍA DE LA INFORMACIÓN – INTERCONEXIÓN DE SISTEMAS
ABIERTOS – EL DIRECTORIO: FORMULARIO DE ENUNCIADO DE
CONFORMIDAD DE IMPLEMENTACIÓN DE PROTOCOLO
PARA EL PROTOCOLO DE ACCESO AL DIRECTORIO**

1 Alcance

Esta Recomendación | Norma Internacional contiene el formulario de PICS para el protocolo de acceso al directorio (DAP, *directory access protocol*) especificado en las Recomendaciones de la serie UIT-T X.500 (1993) | ISO/CEI 9594:1995. Este formulario de PICS se ajusta a los requisitos pertinentes y a las directrices aplicables indicadas en la Recomendación UIT-T X.296 | ISO/CEI 9646-7.

El proveedor de una implementación de DAP que alega conformarse con las Recomendaciones de la serie UIT-T X.500 | ISO/CEI 9594 tiene que rellenar un ejemplar del formulario de PICS que figura en el anexo A y proporcionar la información necesaria para identificar tanto al proveedor como a la implementación.

El campo de aplicación de la presente Recomendación | Norma Internacional es la especificación de los enunciados de conformidad de un agente de usuario de directorio (DUA, *directory user agent*) y un agente de sistema de directorio (DSA, *directory system agent*).

2 Referencias normativas

Las siguientes Recomendaciones y Normas Internacionales contienen disposiciones que, mediante su referencia en este texto, constituyen disposiciones de la presente Recomendación | Norma Internacional. Los miembros de la CEI y de la ISO mantienen registros de las Normas Internacionales actualmente vigentes. La Oficina de Normalización de las Telecomunicaciones de la UIT mantiene una lista de las Recomendaciones UIT-T actualmente vigentes.

2.1 Recomendaciones | Normas Internacionales idénticas

- Recomendación UIT-T X.500 (1993) | ISO/CEI 9594-1:1995, *Tecnología de la información – Interconexión de sistemas abiertos – El directorio – Visión de conjunto de conceptos, modelos y servicios.*
- Recomendación UIT-T X.501 (1993) | ISO/CEI 9594-2:1995, *Tecnología de la información – Interconexión de sistemas abiertos – El directorio: Modelos.*
- Recomendación UIT-T X.509 (1993) | ISO/CEI 9594-8:1995, *Tecnología de la información – Interconexión de sistemas abiertos – El directorio – Marco de autenticación.*
- Recomendación UIT-T X.511 (1993) | ISO/CEI 9594-3:1995, *Tecnología de la información – Interconexión de sistemas abiertos – El directorio – Definición de servicio abstracto.*
- Recomendación UIT-T X.518 (1993) | ISO/CEI 9594-4:1995, *Tecnología de la información – Interconexión de sistemas abiertos – El directorio – Procedimientos para operación distribuida.*
- Recomendación UIT-T X.519 (1993) | ISO/CEI 9594-5:1995, *Tecnología de la información – Interconexión de sistemas abiertos – El directorio – Especificaciones de protocolo.*
- Recomendación UIT-T X.520 (1993) | ISO/CEI 9594-6:1995, *Tecnología de la información – Interconexión de sistemas abiertos – El directorio: Tipos de atributos seleccionados.*
- Recomendación UIT-T X.521 (1993) | ISO/CEI 9594-7:1995, *Tecnología de la información – Interconexión de sistemas abiertos – El directorio: Clases de objetos seleccionados.*
- Recomendación UIT-T X.525 (1993) | ISO/CEI 9594-9:1995, *Tecnología de la información – Interconexión de sistemas abiertos – El directorio: Replicación.*

2.2 Pares de Recomendaciones | Normas Internacionales con contenido técnico equivalente

- Recomendación UIT-T X.290 (1995), *Metodología y marco de las pruebas de conformidad de interconexión de sistemas abiertos de las Recomendaciones sobre los protocolos para aplicaciones del UIT-T – Conceptos generales*.

ISO/CEI 9646-1:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General Concepts*.

- Recomendación UIT-T X.296 (1995), *Metodología y marco de las pruebas de conformidad de interconexión de sistemas abiertos de las Recomendaciones sobre los protocolos para aplicaciones del UIT-T – Declaraciones de conformidad de implementación*.

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

2.3 Otras referencias

ISO/CEI 10646-1:1993 as amended, *Information technology – Universal Multiple-Octet Coded Character Set (UCS) – Part 1: Architecture and Basic Multilingual Plane*.

3 Definiciones

A los efectos de la presente Recomendación | Norma Internacional, se aplican las siguientes definiciones.

3.1 Definiciones relativas al directorio

En la presente Recomendación | Norma Internacional se utilizan los términos definidos en las Recomendaciones de la serie UIT-T X.500 | ISO/CEI 9594.

3.2 Definiciones relativas a la conformidad

Los siguientes términos se definen en la Rec. UIT-T X.290 | ISO/CEI 9646-1:

- a) enunciado de conformidad de implementación de protocolo (PICS, *protocol implementation conformance statement*);
- b) formulario de PICS;
- c) conformidad;
- d) requisito obligatorio;
- e) requisito optativo;
- f) requisito condicional.

3.3 Definiciones relativas a la conformidad del directorio básico

Los términos siguientes se definen en esta Recomendación | Norma Internacional.

3.3.1 agente de sistema de directorio centralizado: DSA que no es capaz de mantener información de conocimiento sobre otros DSA. Este DSA no es capaz de devolver reenvíos.

3.3.2 agente de sistema de directorio cooperante: DSA que es capaz de mantener referencias de conocimiento. Este DSA es capaz de devolver reenvíos y también puede ser un DSA encadenante.

3.3.3 agente de sistema de directorio encadenante: DSA cooperante que es capaz de invocar operaciones encadenadas, funcionando como un invocador DSP. Un DSA encadenante es también un DSA cooperante.

3.3.4 nivel de seguridad: Se declararán sendos niveles de seguridad para la autenticación de la entidad par, la autenticación del originador y la autenticación de los resultados:

- a) para la autenticación de originador hay cinco niveles de seguridad, a saber, "ninguno", "simple sin contraseña", "simple con contraseña no protegida", "simple con contraseña protegida" y "fuerte";

- b) para la autenticación de entidad par hay tres niveles de seguridad, a saber, "ninguno", "simple con nombre distinguido" y "fuerte";
- c) para la autenticación de resultados hay dos niveles de seguridad, a saber, "ninguno" y "fuerte".

4 Abreviaturas

En el presente enunciado de conformidad de implementación de protocolo, se utilizan las siguientes abreviaturas.

ACI	Información de control de acceso (<i>access control information</i>)
CCITT	Comité Consultivo Internacional Telegráfico y Telefónico
CEI	Comisión Electrotécnica Internacional
DAP	Protocolo de acceso al directorio (<i>directory access protocol</i>)
DIB	Base de información de directorio (<i>directory information base</i>)
DISP	Protocolo de sombreado de información del directorio (<i>directory information shadowing protocol</i>)
DIT	Árbol de información de directorio (<i>directory information tree</i>)
DOP	Protocolo de gestión de vinculación operacional del directorio (<i>directory operational binding management protocol</i>)
DSA	Agente de sistema de directorio (<i>directory system agent</i>)
DSP	Protocolo de sistema de directorio (<i>directory system protocol</i>)
DUA	Agente de usuario de directorio (<i>directory user agent</i>)
ISO	Organización Internacional de Normalización (<i>International Organization for Standardization</i>)
IUT	Implementación sometida a prueba (<i>implementation under test</i>)
NSAP	Punto de acceso a servicio de red (<i>network service access point</i>)
NSSR	Referencia subordinada no específica (<i>non-specific subordinate reference</i>)
PDU	Unidad de datos de protocolo (<i>protocol data unit</i>)
PICS	Enunciado de conformidad de implementación de protocolo (<i>protocol implementation conformance statement</i>)
RDN	Nombre distinguido relativo (<i>relative distinguished name</i>)
ROSE	Elemento de servicio de operaciones a distancia (<i>remote operations service element</i>)
UIT	Unión Internacional de Telecomunicaciones
UIT-T	Unión Internacional de Telecomunicaciones – Sector de Normalización de las Telecomunicaciones

5 Convenios

Esta Recomendación | Norma Internacional se refiere exclusivamente a la segunda edición de las especificaciones de directorio enumeradas en la cláusula 2.

6 Conformidad

Un formulario de PICS conforme será técnicamente equivalente a las Recomendaciones de la serie UIT-T X.500 | ISO/CEI 9594 y conservará la numeración y el orden de los puntos de las Recomendaciones de la serie UIT-T X.500 (1993) | ISO/CEI 9594:1995.

Un formulario de PICS conforme a esta Recomendación | Norma Internacional:

- a) describirá una implementación que se ajusta a las Recomendaciones de la serie UIT-T X.500 | ISO/CEI 9594;
- b) será un formulario de PICS conforme, que se ha rellenado de acuerdo con las instrucciones indicadas en A.2;
- c) incluirá la información necesaria para identificar de manera única al suministrador y a la implementación.

Anexo A¹⁾

**Protocolo de acceso al directorio –
Formulario de enunciado de conformidad de implementación de protocolo (PICS)**

(Este anexo es parte integrante de esta Recomendación | Norma Internacional)

A.1 Identification of the ICS 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.

Identification of corrigenda applied to this PICS proforma	ITU-T X.583 (1997) ISO/IEC 13248-1:1998 Corr: Corr: Corr: Corr:
--	---

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 ITU-T Rec. X.500-Series (1993) | ISO/IEC 9594:1995 with 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 mandatory capabilities for which no implementation choice is allowed. Each item includes an item number, 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 the identification of the implementation.

Subclause A.4 is for identifying the protocol within ITU-T Rec. X.500-Series | ISO/IEC 9594.

Subclause A.5 is for the identification of the Technical Corrigenda to the protocol.

Subclause A.6 contains 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 the tables in the PICS proforma. These have allowed the use of multi-column layout where the columns are headed 'Status' and 'Support'. Definitions of each are given below. Additionally, the following definitions apply.

A.2.2.1.1 (PICS) item: A row in the 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 value 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.

¹⁾ **Comunicado sobre derechos de autor del formulario de ICS**

Los usuarios de esta Recomendación | Norma Internacional pueden reproducir libremente el formulario de ICS de este anexo a fin de que pueda ser utilizado para los fines previstos, y pueden además publicar el ICS cumplimentado.

A.2.2.1.4 (support) answer: An allowed entry in the support values columns for an item in PICS, in answer to a PICS question.

A.2.2.2 Prerequisite notation

If a predicate applies to a whole table, a prerequisite line may be specified in front of the table to which it applies. A prerequisite line takes the form:

Prerequisite: <Predicate>

The meaning of such a line is that if <predicate> is True, then the table applies, else it is not applicable.

A.2.2.3 Item reference numbers

Each line within the PICS proforma 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 labeled a, b, c, etc., from left to right, and this letter is appended to the sequence.

An example of the use of this notation would be A.6.3.3.1.1/1, which refers to the support for credentials in a DirectoryBind protocol data unit.

A.2.2.4 Status column

This column indicates the level of support required for conformance to this Recommendation | International Standard.

The values are as follows:

- m The capability is required to be implemented in conformance with the related specification
- o The capability may be implemented and if it is implemented it is required to conform to the related specification
- c The requirement on the capability depends on the selection of other optional or conditional items
- i The capability is outside the scope of this PICS, and hence irrelevant and not subject to conformance testing
- In the given context it is impossible to use this capability

Nested conditionals are denoted by nested numbering (e.g. 1, 1.1, 1.1.1, etc.) of the item descriptions in the tables. A table may have zero, one or more levels of nesting. The status of a leading item is specified by its status entry, as defined above. The status of a subordinate (that is nested) item is specified as follows: if the superior item is supported, the status of the subordinate item is determined by its status column entry and applicable predicate, if any. If the superior item is not supported, the subordinate item is not applicable, independent of its status column entry.

The Status "DUA" or "DSA" identifies whether the implementation is a DUA or DSA, respectively.

A.2.2.5 Support column

This column shall be completed by the supplier or implementor, to indicate the level of implementation of each item. An item is not considered implemented simply because a default value has been defined by the standard. In order for an Implementation Under Test (IUT) to claim a protocol element is implemented, it must have the ability, where appropriate, to generate, receive, and perform the appropriate action.

The proforma is designed such that support values are:

- Y Yes, the item has been implemented
- N No, the item has not been implemented
- The item is not applicable

A.2.2.6 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 explicitly requires that capability);
- 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, 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 the 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 the specified syntax, and hence data types, to which every value in such attributes shall conform.

A.2.2.7 Predicate column

The item number contained in the predicate column, if any, means that the status in the "Status" column applies only when the PICS states that one or more features identified by the item is supported.

A.2.2.8 Predicate Name

The predicate name indicates that name upon which the predicate is based. A predicate name flagged with an asterisk preceding the predicate name indicates the condition by which the predicate is being set. A predicate name not flagged with an asterisk indicates the predicate on which the conditional support is based.

Note that the predicate may be set by the DUA or DSA but only applies for the type of agent claiming support. For example, if an implementation includes both a DUA and a DSA, then if the DSA supports the Read operation (which is mandatory for a DSA), the "Read" predicate will be set for the DSA only. If the Read operation is also supported for the DUA (which is optional) the predicate would be set for both the DUA and DSA.

A.2.2.9 Note column

This column indicates the following:

notexx: Refers to Note xx

d(xx): A default value xx within () is defined in the standard. When absent in the PDU, both sender and receiver shall interpret it as having the default value specified in the standard.

See xx: Refers to Table xx

A.2.3 Instructions for completing the PICS proforma

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.

All entries within the PICS proforma shall be made in ink. Alterations to such entries shall be made by crossing out, not erasing or making the original entry illegible, and writing the new entry alongside the alteration. All such alterations to records shall be initialized by the staff making them.

A.3 Identification of the implementation**A.3.1 Identification of PICS**

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

A.3.2 Identification of the implementation and/or system

Item No.	Question	Response
1	Implementation Name	
2	Version Number	
3	Machine Name	
4	Machine Version Number	
5	Operating System Name	
6	Operating System Version No.	
7	Other information	

A.3.3 Identification of the system supplier

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

A.3.4 Identification of the testlab client

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

A.4 Identification of the protocol

Item No.	Identification of protocol specification	Support
1	ITU-T Rec. X.500 (1993) ISO/IEC 9594-1:1995, <i>Information technology – Open Systems Interconnection – The Directory: Overview of concepts, models and services</i>	
2	ITU-T Rec. X.501 (1993) ISO/IEC 9594-2:1995, <i>Information technology – Open Systems Interconnection – The Directory: Models</i>	
3	ITU-T Rec. X.511 (1993) ISO/IEC 9594-3:1995, <i>Information technology – Open Systems Interconnection – The Directory: Abstract service definition</i>	
4	ITU-T Rec. X.518 (1993) ISO/IEC 9594-4:1995, <i>Information technology – Open Systems Interconnection – The Directory: Procedures for distributed operations</i>	
5	ITU-T Rec. X.519 (1993) ISO/IEC 9594-5:1995, <i>Information technology – Open Systems Interconnection – The Directory: Protocol specifications</i>	
6	ITU-T Rec. X.520 (1993) ISO/IEC 9594-6:1995, <i>Information technology – Open Systems Interconnection – The Directory: Selected Attribute Types</i>	
7	ITU-T Rec. X.521 (1993) ISO/IEC 9594-7:1995, <i>Information technology – Open Systems Interconnection – The Directory: Selected object classes</i>	
8	ITU-T Rec. X.509 (1993) ISO/IEC 9594-8:1995, <i>Information technology – Open Systems Interconnection – The Directory: Authentication framework</i>	
9	ITU-T Rec. X.525 (1993) ISO/IEC 9594-9:1995, <i>Information technology – Open Systems Interconnection – The Directory: Replication</i>	

A.5 Identification of corrigenda to the protocol

Item No.	Specification	Technical Corrigenda	Support
1	ITU-T Rec. X.501 (1993) ISO/IEC 9594-2:1995	Cor.1: 1995	
2	ITU-T Rec. X.501 (1993) ISO/IEC 9594-2:1995	Cor.2: 1995	
3	ITU-T Rec. X.509 (1993) ISO/IEC 9594-8:1995	Cor.1: 1995	
4	ITU-T Rec. X.509 (1993) ISO/IEC 9594-8:1995	Cor.2: 1995	
5	ITU-T Rec. X.509 (1993) ISO/IEC 9594-8:1995	Cor.3: 1995	
6	ITU-T Rec. X.511 (1993) ISO/IEC 9594-3:1995	Cor.1: 1995	
7	ITU-T Rec. X.511 (1993) ISO/IEC 9594-3:1995	Cor.2: 1995	
8	ITU-T Rec. X.518 (1993) ISO/IEC 9594-4:1995	Cor.1: 1995	
9	ITU-T Rec. X.518 (1993) ISO/IEC 9594-4:1995	Cor.2: 1995	
10	ITU-T Rec. X.519 (1993) ISO/IEC 9594-5:1995	Cor.1: 1995	
11	ITU-T Rec. X.520 (1993) ISO/IEC 9594-6:1995	Cor.1: 1995	
12	ITU-T Rec. X.525 (1993) ISO/IEC 9594-9:1995	Cor.1: 1995	
13	ITU-T Rec. X.525 (1993) ISO/IEC 9594-9:1995	Cor.2: 1995	

A.6 ICS proforma tables

A.6.1 Roles

Item No.	Role	Status	Support	Predicate Name
1	Centralized DSA	o		
2	Cooperating DSA	o		*CoOp-DSA
3	First-Level DSA	o		*FirstLevel-DSA
4	DUA for connection to centralized DSA	o		
5	DUA for connection to cooperating DSA	o		*CoOp-DUA

A.6.2 General capabilities and global statement of conformance

If the supplied implementation is a DSA implementation, A.6.2.1 is required to be answered by the supplier. In addition, appropriate DSA support/status columns in A.6.3, A.6.4 and A.6.5 apply.

If the supplied implementation is a DUA implementation, A.6.2.2 is required to be answered by the supplier. In addition, appropriate DUA support/status columns in A.6.3, A.6.4 and A.6.5 apply.

Answering "No" to A.6.2.1.1/1 or A.6.2.2.1/1 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.6.6 "Other information".

A.6.2.1 DSA Capabilities

A.6.2.1.1 General capabilities

Item No.	Question	Status	Support	Predicate Name
1	Are all mandatory general capabilities for the DSA implemented?	m		
2	Are all mandatory first-level DSA requirements (ITU-T Rec. X.518 ISO/IEC 9594-4) implemented?	c1		
3	Are the minimum knowledge requirements (ITU-T Rec. X.501 ISO/IEC 9594-2) implemented?	m		
4	Is asynchronous (ROSE class 2) mode of operation supported?	m		*Async-DSA
5	Does the DSA follow the rules of extensibility as defined in 7.5 of ITU-T Rec. X.519 ISO/IEC 9594-5?	m		
6	Is the alias mechanism implemented?	m		
7	Does the DSA support the directoryAccessAC application-context?	m		
8	Is the DSA capable of supporting collective attributes?	o		*Coll-Attr
9	Is the DSA capable of supporting hierarchical attributes (Subtypes)?	o		
10	Is the DSA capable of supporting auxiliary object classes?	o		
11	Is the DSA capable of supporting the subschema administrative operational attributes?	o		*SubSchema
12	Does the DSA support signed DAP operations and results?	o		*Signed-Ops
13	Does the DSA support NSSR?	o		*NSSR
c1: If [FirstLevel-DSA] then m else i				

A.6.2.1.2 Supported Security Levels

Item No.	Security Levels	Status	Support	Predicate Name
1	none	o.1		
2	simple	o.1		*Simple-DSA
3	strong	o.1		*Strong-DSA
4	external	i		
o.1 The DSA must support at least one security level, unless the external mechanism is supported.				

A.6.2.1.3 Supported Access Control Schemes

Item No.	Access Control Scheme	Status	Support	Predicate Name
1	Simplified Access Control	o		*SAC-DSA
2	Basic Access Control	o		*BAC-DSA
3	Other	i		

A.6.2.2 DUA capabilities**A.6.2.2.1 General capabilities**

Item No.	Question	Status	Support	Predicate Name
1	Are all mandatory general capabilities for the DUA implemented?	m		
2	Is the directoryAccessAC application-context supported?	m		
3	Is asynchronous (ROSE class 2) mode of operation supported?	o		*Async-DUA
4	Does the DUA follow the rules of extensibility as defined in 7.5 of ITU-T Rec. X.519 ISO/IEC 9594-5?	m		
5	Does the DUA support signed DAP operations and results?	o		*Signed-Ops

A.6.2.2.2 Supported Security Levels

Item No.	Question	Status	Support	Predicate Name
1	none	o.2		
2	simple	o.2		*Simple-DUA
3	strong	o.2		*Strong-DUA
4	external	i		
o.2: The DUA must support at least one security level, unless the external mechanism is supported.				

A.6.2.2.3 Supported Access Control Schemes

Item No.	Access Control Scheme	Status	Support	Predicate Name
1	Simplified Access Control	o		*SAC-DUA
2	Basic Access Control	o		*BAC-DUA
3	Other	i		

A.6.3 Capabilities and options

This part of the PICS proforma identifies the supported application context, the PDUs and operations.

In addition, the operation arguments and PDU parameters are identified.

A.6.3.1 Supported application context

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

A.6.3.2 Operations and extensions**A.6.3.2.1 Operations (Ref. X.511 | 9594-3)**

Item No.	Protocol Element	DUA		DSA		Predicate Name	Note
		Status	Support	Status	Support		
1	DirectoryBind	m		m			
2	DirectoryUnbind	m		m			
3	Read	o		m		*Read	
4	Compare	o		m		*Compare	
5	Abandon	c2		c3		*Abandon	Note 1
6	List	o		m		*List	
7	Search	o		m		*Search	
8	AddEntry	o		m		*AddEntry	
9	RemoveEntry	o		m		*RemoveEntry	
10	ModifyEntry	o		m		*ModifyEntry	
11	ModifyDN	o		m		*ModifyDN	Note 2
c2: If [[Async-DUA] then support of this feature is o else –. c3: If [Async-DSA] then support of this feature is m else –. NOTE 1 – The Abandon operation can only be supported if the asynchronous mode (ROSE class 2) of operation is supported in A.6.2.1.1/4 or A.6.2.2.1/3 for DSA and DUA respectively. NOTE 2 – 1988-edition systems may use the operation only to change the Relative Distinguished Name of a leaf entry.							

A.6.3.2.2 Extensions (Ref. X.511 | 9594-3, 7.3.1)

This table defines a number of extensions which are available in the 1993 edition of the Directory. The supplier of the implementation shall indicate in the following table, for which extensions conformance is claimed.

Item No.	Extension	DUA		DSA		Predicate Name	Note
		Status	Support	Status	Support		
1	subentries	o		o		*Subentries	
2	copyShallDo	o		o			
3	attributesizelimit	o		o		*attrsizelimit	
4	extraAttributes	o		o			
5	modifyRightsRequest	o		o		*modrightsreq	
6	pagedResultsRequest	o		o		*pageresreq	Note
7	matchedValuesOnly	o		o		*matchvalonly	
8	extendedFilter	o		o		*extfilter	
9	targetSystem	o		o		*targetsystem	
10	useAliasOnUpdate	o		o			
11	newSuperior	o		o		*newsuperior	
NOTE – Paged results can only be supported for unsigned operations. DSAs which support signed operations should only return paged results when performing unsigned operations.							

A.6.3.3 Protocol Elements

Some protocol elements may be digitally signed. In those cases where an operation can be signed, the PICS table is divided into signed / unsigned columns for the DUA and DSA respectively. Suppliers of implementations claiming conformance to signed protocol elements, for a given operation, should supply responses to the appropriate status/support columns under the signed column. Suppliers of implementations not claiming conformance to signed protocol elements should supply responses to the status/support columns under the unsigned column. Note that update operations return NULL results and that errors are often single integers. They therefore are not digitally signed. To do so could compromise the private key of the digital signature.

A.6.3.3.1 DirectoryBind Element (Ref. X.511 | 9594-3, 8.1)**A.6.3.3.1.1 Directory Bind Arguments** (Ref. X.511 | 9594-3, 8.1.2)

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	credentials	c4		c4			
1.1	simple	c:c5		c:c5			
1.1.1	name	c:m		c:m			
1.1.2	validity	c:o		c:o			
1.1.2.1	time1	c:o		c:o			
1.1.2.2	time2	c:o		c:o			
1.1.2.3	random1	c:o		c:o			
1.1.2.4	random2	c:o		c:o			
1.1.3	password	c:o		c:o		*Password	
1.1.3.1	unprotected	c:o.3		c:o.3			
1.1.3.2	protected	c:o.3		c:o.3			
1.1.3.2.1	algorithmIdentifier	c:m		c:m		*Algor-ID	See A.6.3.3.23.2
1.1.3.2.2	encrypted	c:m		c:m			

A.6.3.3.1.1 Directory Bind Arguments (Ref. X.511 | 9594-3, 8.1.2) *(continued)*

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1.2	strong	c:c6		c:c6			
1.2.1	certification-path	c:o		c:o		*Cert-Path	See A.6.3.3.23
1.2.2	bind-token	c:m		c:m			
1.2.2.1	toBeSigned	c:m		c:m			
1.2.2.1.1	algorithm	c:m		c:m			
1.2.2.1.2	name	c:m		c:m			
1.2.2.1.3	time	c:m		c:m			
1.2.2.1.4	random	c:m		c:m			
1.2.2.2	algorithmIdentifier	c:m		c:m		*Algor-ID	See A.6.3.3.23.2
1.2.2.3	encrypted	c:m		c:m			
1.2.3	name	c:o		c:o			
1.3	externalProcedure	i		i			
2	versions	m		m			d(v1)
2.1	v1	m		m			
c4: If [Strong-DUA or Simple-DUA, Simple-DSA or Strong-DSA] then support of this feature is m else o. c5: If [Simple-DUA, Simple-DSA] then support of this feature is m else o. c6: If [Strong-DUA, Strong-DSA] then support of this feature is m else o. o.3: At least one of the items must be supported.							

A.6.3.3.1.2 Directory Bind Result (Ref. X.511 | 9594-3, 8.1.2)

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	credentials	c4		c4			
1.1	simple	c:c5		c:c5			
1.1.1	name	c:m		c:m			
1.1.2	validity	c:o		c:o			
1.1.2.1	time1	c:o		c:o			
1.1.2.2	time2	c:o		c:o			
1.1.2.3	random1	c;o		c;o			
1.1.2.4	random2	c:o		c:o			
1.1.3	password	c:o		c:o		*Password	
1.1.3.1	unprotected	c:o.3		c:o.3			
1.1.3.2	protected	c:o.3		c:o.3			
1.1.3.2.1	algorithmIdentifier	c:m		c:m		*Algor-ID	See A.6.3.3.23.2
1.1.3.2.2	encrypted	c:m		c:m			

A.6.3.3.1.2 Directory Bind Result (Ref. X.511 | 9594-3, 8.1.2) (*continued*)

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1.2	strong	c:c6		c:c6			
1.2.1	certification-path	c:o		c:o		*Cert-Path	See A.6.3.3.23
1.2.2	bind-token	c:m		c:m			
1.2.2.1	toBeSigned	c:m		c:m			
1.2.2.1.1	algorithm	c:m		c:m			
1.2.2.1.2	name	c:m		c:m			
1.2.2.1.3	time	c:m		c:m			
1.2.2.1.4	random	c:m		c:m			
1.2.2.2	algorithmIdentifier	c:m		c:m		*Algor-ID	See A.6.3.3.23.2
1.2.2.3	encrypted	c:m		c:m			
1.2.3	name	c:o		c:o			
1.3	externalProcedure	i		i			
2	versions	m		m			d(v1)
2.1	v1	m		m			
c4: If [Strong-DUA or Simple-DUA, Simple-DSA or Strong-DSA] then support of this feature is m else o. c5: If [Simple-DUA, Simple-DSA] then support of this feature is m else o. c6: If [Strong-DUA, Strong-DSA] then support of this feature is m else o. o.3: At least one of the items must be supported.							

A.6.3.3.1.3 Directory Bind Error (Ref. X.511 | 9594-3, 8.1.4)

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	versions	m		m			d(v1)
1.1	v1	m		m			
2	error	m		m			
2.1	ServiceError	m		m			
2.2	SecurityError	m		m			

A.6.3.3.2 Directory Unbind Elements (Ref. X.511 | 9594-3, 8.2)

DirectoryUnbind has no arguments (see 8.2 of ITU-T Rec. X.511 | ISO/IEC 9594-3).

A.6.3.3.3 Read Elements (Ref. X.511 | 9594-3, 9.1)

Prerequisite: [Read]

Item No.	Protocol Element	DUA				DSA				Predicate	Note
		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support		
1	ReadArgument	m		m		m		m			
1.1	toBeSigned	–		m		–		m			
1.2	object	m		m		m		m			
1.3	selection	m		m		m		m			d({})
1.4	modifyRightsRequest	c7		c7		c7		c7			d(false)
1.5	CommonArguments	m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.6	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
1.7	encrypted	–		m		–		m			
2	ReadResult	m		m		m		m			
2.1	toBeSigned	–		m		–		m			
2.2	entry	m		m		m		m			
2.3	modifyRights	o		o		o		o			
2.3.1	item	c:m		c:m		c:m		c:m			
2.3.1.1	entry	c:o		c:o		c:m		c:m			
2.3.1.2	attribute	c:o		c:o		c:m		c:m			
2.3.1.3	value	c:o		c:o		c:m		c:m			
2.3.2	permission	c:o		c:o		c:m		c:m			
2.4	CommonResults	m		m		m		m		*Comm-Res	See A.6.3.3.14
2.5	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
2.6	encrypted	–		m		–		m			
3	Errors	m		m		m		m			See A.6.3.3.12
c7: If [modrightsreq] then support of this feature is m else o.											

A.6.3.3.4 Compare Elements (Ref. X.511 | 9594-3, 9.2)

Prerequisite: [Compare]

Item No.	Protocol Element	DUA				DSA				Predicate	Note
		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support		
1	CompareArgument	m		m		m		m			
1.1	toBeSigned	–		m		–		m			
1.2	object	m		m		m		m			
1.3	purported	m		m		m		m			
1.4	CommonArguments	m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.5	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
1.6	encrypted	–		m		–		m			
2	CompareResult	m		m		m		m			
2.1	toBeSigned	–		m		–		m			
2.2	name	o		o		o		o			
2.3	matched	m		m		m		m			
2.4	fromEntry	o		o		m		m			d(true)
2.5	matchedSubtype	o		o		o		o			
2.6	CommonResults	m		m		m		m		*Comm-Res	See A.6.3.3.14
2.7	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
2.8	encrypted	–		m		–		m			
3	Errors	m		m		m		m			See A.6.3.3.12

A.6.3.3.5 Abandon Elements (Ref. X.511 | 9594-3, 9.3)

Prerequisite: [Abandon]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	AbandonArgument	m		m			
1.1	InvokeID	m		m			
2	AbandonResult	m		m			
3	Errors	m		m			AbandonFailed error

A.6.3.3.6 List Elements (Ref. X.511 | 9594-3, 10.1)

Prerequisite: [List]

Item No.	Protocol Element	DUA				DSA				Predicate	Note
		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support		
1	ListArgument	m		m		m		m			
1.1	toBeSigned	–		m		–		m			
1.2	object	m		m		m		m			
1.3	pagedResults	c8		c8		c8		c8			See A.6.3.3.20
1.4	CommonArguments	m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.5	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
1.6	encrypted	–		m		–		m			
2	ListResult	m		m		m		m			
2.1	toBeSigned	–		m		–		m			
2.2	listInfo	m		m		m		m			
2.2.1	name	o		o		o		o			
2.2.2	subordinates	m		m		m		m			
2.2.2.1	rdn	m		m		m		m			
2.2.2.2	aliasEntry	o		o		m		m			d(false)
2.2.2.3	fromEntry	o		o		m		m			d(true)
2.2.3	partialOutcomeQualifier	o		o		m		m			
2.2.3.1	limitProblem	c:o		c:o		–o		–o			
2.2.3.1.1	timeLimitExceeded	c:m		c:m		c:m		c:m			
2.2.3.1.2	sizeLimitExceeded	c:m		c:m		c:m		c:m			
2.2.3.1.3	administrativeLimitExceeded	c:m		c:m		c:m		c:m			
2.2.3.2	unexplored	c:o		c:o		o		o			See A.6.3.3.21
2.2.3.3	unavailableCriticalExtensions	c:m		c:m		m		m			d(false)
2.2.3.4	unknownErrors	c:o		c:o		o		o			
2.2.3.5	queryReference	c:c8		c:c8		c8		c8			
2.2.4	CommonResults	m		m		m		m		*Comm-Res	See A.6.3.3.14
2.3	uncorrelatedListInfo	o		c9		–		c9			
2.4	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
2.5	encrypted	–		m		–		m			
3	Errors	m		m		m		m			See A.6.3.3.12
c8: If [pageresreq] then support of this feature is m else o.											
c9: If [CoOp-DUA, CoOp-DSA] then support of this feature is m else o.											

A.6.3.3.7 Search Elements (Ref. X.511 | 9594-3, 10.2)

Prerequisite: [Search]

Item No.	Protocol Element	DUA				DSA				Predicate	Note
		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support		
1	SearchArgument	m		m		m		m			
1.1	toBeSigned	–		m		–		m			
1.2	baseObject	m		m		m		m			
1.3	subset	o		o		m		m			d(0)
1.4	filter	o		o		m		m		*Filter	d(and{ }), See A.6.3.3.18
1.5	searchAliases	o		o		m		m			d(true)
1.6	selection	o		o		m		m		*Info-Sel	d({ }), See A.6.3.3.16
1.7	pagedResults	c8		c8		c8		c8			See A.6.3.3.20
1.8	matchedValuesOnly	o		o		c10		c10			d(false)
1.9	extendedFilter	c11		c11		c11		c11			See A.6.3.3.18
1.10	CommonArguments	m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.11	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
1.12	encrypted	–		m		–		m			
2	SearchResult	m		m		m		m			
2.1	toBeSigned	–		m		–		m			
2.2	searchInfo	m		m		m		m			
2.2.1	name	o		o		o		o			
2.2.2	entries	m		m		m		m		*Entry-Info	See A.6.3.3.17
2.2.3	partialOutcomeQualifier	o		o		m		m			
2.2.3.1	limitProblem	c:o		c:o		o		o			
2.2.3.1.1	timeLimitExceeded	c:m		c:m		c:m		c:m			
2.2.3.1.2	sizeLimitExceeded	c:m		c:m		c:m		c:m			
2.2.3.1.3	administrativeLimitExceeded	c:m		c:m		c:m		c:m			
2.2.3.2	unexplored	c:o		c:o		o		o			See A.6.3.3.21
2.2.3.3	unavailableCriticalExtensions	c:o		c:o		m		m			d(false)
2.2.3.4	unknownErrors	c:o		c:o		o		o			
2.2.3.5	queryReference	c:c8		c:c8		c8		c8			
2.2.4	CommonResults	m		m		m		m		*Comm-Res	See A.6.3.3.14
2.3	uncorrelatedSearchInfo	o		c9		–		c9			
2.4	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
2.5	encrypted	–		m		–		m			
3	Errors	m		m		m		m			See A.6.3.3.12
c8: If [pageresreq] then support of this feature is m else o.											
c9: If [CoOp-DUA, CoOp-DSA] then support of this feature is m else o.											
c10: If [matchvalonly] then support of this feature is m else o.											
c11: If [extfilter] then support of this feature is m else o.											

A.6.3.3.8 Add Entry Elements (Ref. X.511 | 9594-3, 11.1)

Prerequisite: [AddEntry]

Item No.	Protocol Element	DUA				DSA				Predicate	Note
		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support		
1	AddEntryArgument	m		m		m		m			
1.1	toBeSigned	–		m		–		m			
1.2	object	m		m		m		m			
1.3	entry	m		m		m		m			
1.4	targetSystem	c12		c12		c12		c12			See A.6.3.3.26
1.5	CommonArguments	m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.6	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
1.7	encrypted	–		m		–		m			
2	AddEntryResult	m		m		m		m			NULL (NOTE)
3	Errors	m		m		m		m			See A.6.3.3.12
c12: If [targetsystem] then support of this feature is m else o.											
NOTE – Results return a NULL and cannot be signed. Implementation should return unsigned results.											

A.6.3.3.9 Remove Entry Elements (Ref. X.511 | 9594-3, 11.2)

Prerequisite: [RemoveEntry]

Item No.	Protocol Element	DUA				DSA				Predicate	Note
		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support		
1	RemoveEntryArgument	m		m		m		m			
1.1	toBeSigned	–		m		–		m			
1.2	object	m		m		m		m			
1.3	CommonArguments	m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.4	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
1.5	encrypted	–		m		–		m			
2	RemoveEntryResult	m		m		m		m			NULL (NOTE)
3	Errors	m		m		m		m			See A.6.3.3.12
NOTE – Results return a NULL and cannot be signed. Implementation should return unsigned results.											

A.6.3.3.10 Modify Entry Elements (Ref. X.511 | 9594-3, 11.3)

Prerequisite: [ModifyEntry]

Item No.	Protocol Element	DUA				DSA				Predicate	Note
		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support		
1	ModifyEntryArgument	m		m		m		m			
1.1	toBeSigned	–		m		–		m			
1.2	object	m		m		m		m			
1.3	changes	m		m		m		m			
1.3.1	addAttribute	m		m		m		m			
1.3.2	removeAttribute	m		m		m		m			
1.3.3	addValues	m		m		m		m			
1.3.4	removeValues	m		m		m		m			
1.4	CommonArguments	m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.5	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
1.6	encrypted	–		m		–		m			
2	ModifyEntryResult	m		m		m		m			NULL (NOTE)
3	Errors	m		m		m		m			See A.6.3.3.12
NOTE – Results return a NULL and cannot be signed. Implementation should return unsigned results.											

A.6.3.3.11 ModifyDN Elements (Ref. X.511 | 9594-3, 11.4)

Prerequisite: [ModifyDN]

		DUA				DSA					
Item No.	Protocol Element	Unsigned		Signed		Unsigned		Signed		Predicate	Note
		Status	Support	Status	Support	Status	Support	Status	Support		
1	ModifyDNArgument	m		m		m		m			
1.1	toBeSigned	–		m		–		m			
1.2	object	m		m		m		m			
1.3	newRDN	m		m		m		m			
1.4	deleteOldRDN	o		o		m		m			d(false)
1.5	newSuperior	c13		c13		c13		c13			
1.6	CommonArguments	m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.7	algorithmIdentifier	–		m		–		m		*Algor-ID	See A.6.3.3.23.2
1.8	encrypted	–		m		–		m			
2	ModifyDNResult	m		m		m		m			NULL (NOTE)
3	Errors	m		m		m		m			See A.6.3.3.12
c13: If [newsuperior] then support of this feature is m else o.											
NOTE – Results return a NULL and cannot be signed. Implementation should return unsigned results.											

A.6.3.3.12 Errors and Parameters (Ref. X.511 | 9594-3, 12)

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	Abandoned	c14		m			
2	AbandonFailed	c14		m			
2.1	problem	c:m		m			
2.1.1	noSuchOperation	c:m		m			
2.1.2	tooLate	c:m		m			
2.1.3	cannotAbandon	c:m		m			
2.2	operation	c:m		m			
3	AttributeError	c15		m			
3.1	object	c:m		m			
3.2	problems	c:m		m			
3.2.1	problem	c:m		m			
3.2.1.1	noSuchAttributeOrValue	c:m		m			
3.2.1.2	invalidAttributeSyntax	c:m		m			
3.2.1.3	undefinedAttributeType	c:m		m			
3.2.1.4	inappropriateMatching	c:m		m			
3.2.1.5	constraintViolation	c:m		m			
3.2.1.6	attributeOrValueAlreadyExists	c:m		m			
3.3	type	c:m		m			
3.4	value	c:o		o			
4	NameError	c16		m			
4.1	problem	c:m		m			
4.1.1	noSuchObject	c:m		m			
4.1.2	aliasProblem	c:m		m			
4.1.3	invalidAttributeSyntax	c:m		m			
4.1.4	aliasDereferencingProblem	c:m		m			
4.2	matched	c:m		m			
5	Referral	c16		c9			
5.1	candidate	c:m		c:m			See A.6.3.3.21
6	SecurityError	c16		m			
6.1	problem	c:m		m			
6.1.1	InappropriateAuthentication	c:m		m			
6.1.2	invalidCredentials	c:m		m			
6.1.3	insufficientAccessRights	c:m		m			
6.1.4	invalidSignature	c:c17		c17			
6.1.5	protectionRequired	c: c17		c17			
6.1.6	noInformation	c:m		m			

A.6.3.3.12 Errors and Parameters (Ref. X.511 | 9594-3, 12) (*continued*)

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
7	ServiceError	c16		m			
7.1	problem	c:m		m			
7.1.1	busy	c:m		m			
7.1.2	unavailable	c:m		m			
7.1.3	unwillingToPerform	c:m		m			
7.1.4	chainingRequired	c:m		m			
7.1.5	unableToProceed	c:m		m			
7.1.6	invalidReference	c:m		m			
7.1.7	timeLimitExceeded	c:m		m			
7.1.8	administrativeLimitExceeded	c:m		m			
7.1.9	loopDetected	c:m		m			
7.1.10	unavailableCriticalExtension	c:m		m			
7.1.11	outOfScope	c:m		m			
7.1.12	ditError	c:m		m			
7.1.13	invalidQueryReference	c:c18		c18			
8	UpdateError	c19		m			
8.1	problem	c:m		m			
8.1.1	namingViolation	c:m		m			
8.1.2	objectClassViolation	c:m		m			
8.1.3	notAllowedOnNonLeaf	c:m		m			
8.1.4	notAllowed OnRDN	c:m		m			
8.1.5	entryAlreadyExists	c:m		m			
8.1.6	affectsMultipleDSAs	c:m		m			
8.1.7	objectClassModificationProhibited	c:m		m			
c9: If [CoOp-DUA, CoOp-DSA] then support of this feature is m else o. c14: If [Abandon] then support of this feature is m else o. c15: If [Read or Compare or Search or AddEntry or ModifyEntry] then support of this feature is m else o. c16: If [Read or Compare or List or Search or AddEntry or RemoveEntry or ModifyEntry or ModifyDN] then support of this feature is m else o. c17: If [Signed-Ops] then support of this feature is m else –. c18: If [pageresreq] then support of this feature is m else –. c19: If [AddEntry or RemoveEntry or ModifyEntry or ModifyDN] then support of this feature is m else o.							

A.6.3.3.13 Common Arguments Elements (Ref. X.511 | 9594-3, 7.3)

Prerequisite: [Comm-Arg]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	serviceControls	o		m		*Serv-Ctrls	d({}), See A.6.3.3.15
2	securityParameters	c17		c17		*Sec-Param	See A.6.3.3.22
3	requestor	o		o			Note 1
4	operationProgress	o		m			d(nameResolutionPhaseNotStarted)
4.1	nameResolutionPhase	c:o		m			
4.1.1	notStarted	c:m		m			
4.1.2	proceeding	c:m		m			
4.1.3	completed	c:m		m			
4.2	nextRDNTToBeResolved	c:o		o			
5	aliasedRDNs	o		o			Note 2
6	criticalExtensions	o		m			
7	referenceType	o		o			
8	entryOnly	o		m			d(true)
9	exclusions	o		o			
10	nameResolveOnMaster	o		o			d(false)
c17: If [Signed-Ops] then support of this feature is m else –. NOTE 1 – This parameter may be ignored unless the request is signed. NOTE 2 – This parameter is provided for compatibility with the 1988 edition of the Directory. DUAs (and DSAs) implemented according to later editions shall always omit this parameter.							

A.6.3.3.14 Common Results Elements (Ref. X.511 | 9594-3, 7.4)

Prerequisite: [Comm-Res]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	securityParameters	c17		c17		*Sec-Param	See A.6.3.3.22
2	performer	o		o			
3	aliasDereferenced	o		m			d(false)
c17: If [Signed-Ops] then support of this feature is m else –.							

A.6.3.3.15 Service Controls (Ref. X.511 | 9594-3, 7.5)

Prerequisite: [Serv-Ctrls]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	options	o		m			d({})
1.1	preferChaining	c:m		m			
1.2	chainingProhibited	c:m		m			
1.3	localScope	c:m		m			
1.4	dontUseCopy	c:m		m			
1.5	dontDereferenceAliases	c:m		m			
1.6	subentries	c:m		m			
1.7	copyShallDo	c:m		m			
2	priority	o		m			d(medium)
3	timeLimit	o		o			
4	sizeLimit	o		o			
5	scopeOfReferral	o		o			
6	attributeSizeLimit	c20		c20			
c20: If [attrsizeLimit] then support of this feature is m else o.							

A.6.3.3.16 Entry Information Selection (Ref. X.511 | 9594-3, 7.6)

Prerequisite:[Info-Sel]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	attributes	o		m			d(allUserAttributes)
1.1	allUserAttributes	c:m		m			
1.2	select	c:m		m			
2	infoTypes	o		m			d(attributeTypesAndValues)
2.1	attributeTypesOnly	c:m		m			
2.2	attributeTypesAndValues	c:m		m			
3	extraAttributes	o		o			
3.1	allOperationalAttributes	c:m		c:m			
3.2	select	c:m		c:m			

A.6.3.3.17 Entry Information (Ref. X.511 | 9594-3, 7.7)

Prerequisite: [Entry-Info]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	name	m		m			
2	fromEntry	o		m			d(true)
3	information	o		o			
3.1	attributeType	c:m		c:m			
3.2	attribute	c:m		c:m			
4	incompleteEntry	o		m			d(false)

A.6.3.3.18 Filter Elements (Ref. X.511 | 9594-3, 7.8)

Prerequisite: [Filter or extfilter]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	item	o		m		*Filt-Item	See A.6.3.3.19
2	and	o		m			
3	or	o		m			
4	not	o		m			

A.6.3.3.19 Filter Item Elements (Ref. X.511 | 9594-3, 7.8.2)

Prerequisite: [Filt-Item]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	equality	o		m			
2	substrings	o		m			
2.1	type	c:o		m			
2.2	strings	c:o		m			
2.2.1	initial	c:o		m			
2.2.2	any	c:o		m			
2.2.3	final	c:o		m			
3	greaterOrEqual	o		m			
4	lessOrEqual	o		m			
5	present	o		m			
6	approximateMatch	o		m			
7	extensibleMatch	c11		c11			
7.1	matchingRule	c:o		c:m			
7.2	type	c:o		c:m			
7.3	matchValue	c:o		c:m			
7.4	dnAttributes	c:o		c:m			d(false)
c11: If [extfilter] then support of this feature is m else o.							

A.6.3.3.20 Paged Results (Ref. X.511 | 9594-3, 7.9)

Prerequisite: [pageresreq]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	PagedResultsRequest	m		m			
1.1	newRequest	o.4		m			
1.1.1	pageSize	c:m		m			
1.1.2	sortkeys	c:o		o			
1.1.2.1	type	c:m		c:m			
1.1.2.2	orderingRule	c:o		c:o			
1.1.3	reverse	c:m		m			d(false)
1.1.4	unmerged	c:m		m			d(false)
1.2	queryReference	o.4		m			
o.4: At least one of newRequest or queryReference must be present for PagedResultsRequest.							

A.6.3.3.21 Continuation Reference (Ref. X.518 | 9594-4, 10.10)

Prerequisite: [CoOp-DUA or CoOp-DSA]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	targetObject	m		m			
2	aliasedRDNs	o		o			
3	operationProgress	m		m			
3.1	nameResolutionPhase	m		m			
3.1.1	notStarted	m		m			
3.1.2	proceeding	m		m			
3.1.3	completed	m		m			
3.2	nextRDNTToBeResolved	o		m			
4	rdnsResolved	o		o			
5	referenceType	m		m			
6	accessPoints	m		m			
6.1	MasterOrShadowAccessPoint	m		m			
6.1.1	AccessPoint	m		m			
6.1.1.1	ae-title	m		m			
6.1.1.2	address	m		m			
6.1.1.2.1	pSelector	o		m			
6.1.1.2.2	sSelector	o		m			
6.1.1.2.3	tSelector	o		m			
6.1.1.2.4	nAddresses	m		m			
6.1.1.3	protocolInformation	o		o			
6.1.2	category	o		m			d(master)
6.1.2.1	master	c:m		m			
6.1.2.2	shadow	c:m		m			

A.6.3.3.21 Continuation Reference (Ref. X.518 | 9594-4, 10.10) (*continued*)

Prerequisite: [CoOp-DUA or CoOp-DSA]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
6.2	additionalPoints	o		o			
6.2.1	AccessPoint	c:m		c:m			
6.2.1.1	ae-title	c:m		c:m			
6.2.1.2	address	c:m		c:m			
6.2.1.2.1	pSelector	c:o		c:m			
6.2.1.2.2	sSelector	c:o		c:m			
6.2.1.2.3	tSelector	c:o		c:m			
6.2.1.2.4	nAddresses	c:m		c:m			
6.2.1.3	protocolInformation	c:o		c:o			
6.2.2	category	c:o		c:m			d(master)
6.2.2.1	master	c:m		c:m			
6.2.2.2	shadow	c:m		c:m			
7	entryOnly	o		m			d(false)
8	exclusions	o		o			
9	returnToDUA	o		m			d(false)
10	nameResolveOnMaster	o		c21			d(false)
c21: If [NSSR] then support of this feature is m else –.							

A.6.3.3.22 Security Parameters (Ref. X.511 | 9594-3, 7.10)

Prerequisite: [Sec-Param]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	certification-path	m		m		*Cert-Path	See A.6.3.3.23
2	name	o		o			
3	time	o		o			
4	random	o		o			
5	target	o		o			

A.6.3.3.23 CertificationPath (Ref. X.509 | 9594-8, 8)

Prerequisite: [Cert-Path]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	userCertificate	m		m			
2	theCACertificates	o		o			
2.1	forward	c:o.5		c:o.5			
2.2	reverse	c:o.5		c:o.5			
o.5: At least one of the pair shall be present as specified in clause 8 of ITU-T Rec. X.509 ISO/IEC 9594-8.							

A.6.3.3.23.1 Certificate (Ref. X.509 | 9594-8, 8)

Prerequisite: [Cert-Path]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	toBeSigned	m		m			
1.1	version	m		m			d(v1)
1.2	serialNumber	m		m			
1.3	signature	m		m			See A.6.3.3.23.2
1.4	issuer	m		m			
1.5	validity	m		m			
1.5.1	notBefore	m		m			
1.5.2	notAfter	m		m			
1.6	subject	m		m			
1.7	subjectPublicKeyInfo	m		m			
1.7.1	algorithm	m		m			
1.7.2	subjectPublicKey	m		m			
1.8	issuerUniqueIdentifier	o		o			Note
1.9	subjectUniqueIdentifier	o		o			Note
1.10	extensions	c22		c22		*Extensions	See A.6.3.3.23.3
2	algorithmIdentifier	m		m		*Algor-ID	See A.6.3.3.23.2
3	encrypted	m		m			
c22: If version 3 then support of this feature is m else o. NOTE – If present, version must be 2 or 3.							

A.6.3.3.23.2 Algorithm Identifier (Ref. X.509 | 9594-8, 8)

Prerequisite: [Algor-ID]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	algorithm	m		m			
2	parameters	m		m			

A.6.3.3.23.3 Extensions (Ref. X.509 | 9594-8, 8)

Prerequisite: [Extensions]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	extnID	m		m			
2	critical	m		m			
3	extnValue	m		m			

A.6.3.3.24 Access Control (Ref X.501 | 9594-2, 16)**A.6.3.3.24.1 Access Control Information** (Ref. X.501 | 9594-2, 16.4)

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	ACIItem	o		c23		*ACI	
1.1	identificationTag	c:m		c:m			
1.2	precedence	c:m		c:m			
1.3	authenticationLevel	c:m		c:m			
1.3.1	basicLevels	c:m		c:m			
1.3.1.1	level	c:o.6		c:m			
1.3.1.2	localQualifier	c:o.6		c:o			
1.3.2	other	i		i			
1.4	itemOrUserFirst	c:m		c:m			
1.4.1	itemFirst	c:o.7		c:m			
1.4.1.1	protectedItems	c:m		c:m			See A.6.3.3.24.2
1.4.1.2	itemPermissions	c:m		c:m			
1.4.1.2.1	precedence	c:o		c:o			d(A.6.3.3.24.1/3)
1.4.1.2.2	userClasses	c:m		c:m		*User-Class	See A.6.3.3.24.3
1.4.1.2.3	grantsAndDenials	c:m		c:m			See A.6.3.3.24.4
1.4.2	userFirst	c:o.7		c:m			
1.4.2.1	userClasses	c:m		c:m		*User-Class	See A.6.3.3.24.3
1.4.2.2	userPermissions	c:m		c:m			
1.4.2.2.1	precedence	c:o		c:o			d(A.6.3.3.24.1/3)
1.4.2.2.2	protectedItems	c:m		c:m			See A.6.3.3.24.2
1.4.2.2.3	grantsAndDenials	c:m		c:m			See A.6.3.3.24.4
o.6: At least one of level or localQualifier should be present.							
o.7: At least one of itemFirst or userFirst should be present.							
c23: If [SAC-DSA or BAC-DSA] then support of this feature is m else –.							

A.6.3.3.24.2 Protected Items [Ref. X.501 | 9594-2, 16.4.2.4 a)]

Prerequisite: [ACI]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	entry	o		o			
2	allUserAttributeTypes	o		o			
3	attributeType	o		o			
4	allAttributeValues	o		o			
5	allUserAttributeTypes&Values	o		o			
6	attributeValue	o		o			
7	selfValue	o		o			

A.6.3.3.24.3 UserClasses [Ref. X.501 | 9594-2, 16.4.2.4 b)]

Prerequisite: [User-Class]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	allUsers	o		o			
2	thisEntry	o		o			
3	name	o		o			
4	userGroup	o		o			
5	subtree	o		o		*Subtree	See A.6.3.3.24.5

A.6.3.3.24.4 Grants and Denials (Ref. X.501 | 9594-2, 16.4.1)

Prerequisite: [ACI]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	grantAdd	o		m			
2	denyAdd	o		m			
3	grantDiscloseOnError	o		m			
4	denyDiscloseOnError	o		m			
5	grantRead	o		m			
6	denyRead	o		m			
7	grantRemove	o		m			
8	denyRemove	o		m			
9	grantBrowse	o		m			
10	denyBrowse	o		m			
11	grantExport	o		m			
12	denyExport	o		m			
13	grantImport	o		m			
14	denyImport	o		m			
15	grantModify	o		m			
16	denyModify	o		m			
17	grantRename	o		m			
18	denyRename	o		m			
19	grantReturnDN	o		m			
20	denyReturnDN	o		m			
21	grantCompare	o		m			
22	denyCompare	o		m			
23	grantFilterMatch	o		m			
24	denyFilterMatch	o		m			

A.6.3.3.24.5 Subtree Specification (Ref. X.501 | 9594-2, 11.3)

Predicate: [Subentries or Subtree]

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	base	m		m			Note 1
2	ChopSpecification	m		m			
2.1	specificExclusions	o		o			
2.1.1	chopBefore	c:m		c:m			
2.1.2	chopAfter	c:m		c:m			
2.2	minimum	m		m			Note 2
2.3	maximum	o		o			
3	specificationFilter	o		o			
3.1	item	c:m		c:m			
3.2	and	c:m		c:m			
3.3	or	c:m		c:m			
3.4	not	c:m		c:m			
NOTE 1 – At least Null set is supported.							
NOTE 2 – At least a minimum of 0 is supported.							

A.6.3.3.25 Supported References (Ref. X.501 | 9594-2, 20.2.2)

Item No.	Reference	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	Self Reference	o		o			
2	Superior Reference	o		o			
3	Immediate Superior Reference	o		o			
4	Subordinate Reference	o		o			
5	Non-Specific Subordinate Reference	o		o			
6	Cross Reference	o		o			
7	Supplier Reference	i		i			
8	Consumer Reference	i		i			

A.6.3.3.26 Access Point

Item No.	Protocol Element	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	AccessPoint	m		m			
1.1	ae-title	m		m			
1.2	address	m		m			
1.2.1	pSelector	o		m			
1.2.2	sSelector	o		m			
1.2.3	tSelector	o		m			
1.2.4	nAddresses	m		m			
1.3	protocolInformation	o		o			

A.6.4 Directory Schema and Directory System Schema**A.6.4.1 Supported object classes** (Ref. X.521 | 9594-7)**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 ITU-T Rec. X.521 | ISO/IEC 9594-7 for which conformance is claimed.

Item No.	Object class	DUA		DSA		Note
		Status	Support	Status	Support	
1	top	m		m		
2	alias	m		m		
3	country	o		o		
4	locality	o		o		
5	organization	o		o		
6	organizationalUnit	o		o		
7	person	o		o		
8	organizationalPerson	o		o		
9	organizationalRole	o		o		
10	groupOfNames	o		o		
11	groupOfUniqueNames	o		o		
12	residentialPerson	o		o		
13	applicationProcess	o		o		
14	applicationEntity	o		o		
15	dSA	o		o		
16	device	o		o		
17	strongAuthenticationUser	o		o		
18	certificationAuthority	o		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	
	DUA	DSA

A.6.4.2 Directory String Types (Ref. X.520 | 9594-6)

Item No.	Attribute Type	Upperbound	DUA		DSA		Predicate	Note
			Status	Support	Status	Support		
1	DirectoryString		m		m			
1.1	teletexString		m		m			
1.2	printableString		m		m			
1.3	BMPString		o		o		*BMP	
1.4	universalString		o		o		*UCS	

A.6.4.3 Supported Attribute Types**A.6.4.3.1 Attribute Types** (Ref. X.520 | 9594-6)

The supplier of the implementation shall indicate, in the following table, the selected attribute types defined in ITU-T Rec. X.520 | ISO/IEC 9594-6 for which conformance is claimed:

Item No.	Attribute Type	Upperbound	DUA		DSA		Note
			Status	Support	Status	Support	
1	objectClass		m		m		
2	aliasedEntryName		o		o		
3	knowledgeInformation		o		o		
4	name	32768	o		o		
5	commonName	64	c24		c24		
6	surname	64	o		o		
7	givenName	32768	o		o		
8	initials	32768	o		o		
9	generationQualifier	32768	o		o		
10	uniqueIdentifier		o		o		
11	dnQualifier		o		o		
12	serialNumber	64	o		o		
13	countryName		o		o		size = 2
14	localityName	128	o		o		
15	stateOrProvinceName	128	o		o		
16	streetAddress	128	o		o		
17	houseIdentifier	64	o		o		
18	organizationName	64	o		o		
19	organizationalUnitName	64	o		o		
20	title	64	o		o		
21	description	1024	o		o		
22	searchGuide		o		o		
23	enhancedSearchGuide		o		o		
24	businessCategory	128	o		o		

A.6.4.3.1 Attribute Types (Ref. X.520 | 9594-6) (*continued*)

The supplier of the implementation shall indicate, in the following table, the selected attribute types defined in ITU-T Rec. X.520 | ISO/IEC 9594-6 for which conformance is claimed:

Item No.	Attribute Type	Upperbound	DUA		DSA		Note
			Status	Support	Status	Support	
25	postalAddress	6(lines) × 30(chs)	o		o		
26	postalCode	40	o		o		
27	postOfficeBox	40	o		o		
28	physicalDeliveryOfficeName	128	o		o		
29	telephoneNumber	32	o		o		
30	telexNumber	14, 4, 8	o		o		
31	teletexTerminalIdentifier	1024	o		o		
32	facsimileTelephoneNumber	32	o		o		
33	X.121 Address	15	o		o		
34	internationalISDNNumber	16	o		o		
35	registeredAddress	6(lines) × 30(chs)	o		o		
36	destinationIndicator	128	o		o		
37	preferredDeliveryMethod		o		o		
38	presentationAddress		o		o		
39	supportedApplicationContext		o		o		
40	protocolInformation		o		o		
41	distinguishedName		o		o		
42	member		o		o		
43	uniqueMember		o		o		
44	owner		o		o		
45	roleOccupant		o		o		
46	seeAlso		o		o		
47	userPassword	128	c25		c25		
48	userCertificate		c26		c26		
49	cACertificate		c26		c26		
50	authorityRevocationList		o		o		
51	certificateRevocationList		o		o		
52	crossCertificatePair		o		o		
c24: If [Subentries] then support for this attribute is m else o. c25: If [Password] then support for this attribute is m else o. c26: If [Strong-DSA] then support of this feature is m else o.							

A.6.4.3.2 Collective Attribute Types

The supplier of the implementation shall indicate, in the following table, the selected collective attribute types defined in ITU-T Rec. X.520 | ISO/IEC 9594-6 for which conformance is claimed:

Item No.	Attribute Type	Upperbound	DUA		DSA		Note
			Status	Support	Status	Support	
1	collectiveLocalityName	128	o		o		
2	collectiveStateOrProvinceName	128	o		o		
3	collectiveStreetAddress	128	o		o		
4	collectiveOrganizationName	64	o		o		
5	collectiveOrganizationalUnitName	64	o		o		
6	collectivePostalAddress	6(lines) × 30(chs)	o		o		
7	collectivePostalCode	40	o		o		
8	collectivePostOfficeBox	40	o		o		
9	collectivePhysicalDeliveryOfficeName	128	o		o		
10	collectiveTelephoneNumber	32	o		o		
11	collectiveTelexNumber	14,4,8	o		o		
12	collectiveTeletexTerminalIdentifier	1024	o		o		
13	collectiveFacsimileTelephoneNumber	32	o		o		
14	collectiveInternationalISDNNumber	16	o		o		

A.6.4.3.3 Other Supported Attribute Types

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	Attribute types	
	DUA	DSA

A.6.4.4 Matching Rules (Ref. X.520 | 9594-6)

The supplier of the implementation shall indicate, in the following table, the matching rules defined in ITU-T Rec. X.520 | ISO/IEC 9594-6 for which support is claimed:

Item No.	Matching Rule	DUA		DSA		Note
		Status	Support	Status	Support	
1	caseIgnoreMatch	o		o		
2	caseIgnoreOrderingMatch	o		o		
3	caseIgnoreSubstringMatch	o		o		
4	caseExactMatch	o		o		
5	caseExactOrderingMatch	o		o		
6	caseExactSubstringsMatch	o		o		
7	numericStringMatch	o		o		
8	numericStringOrderingMatch	o		o		
9	numericStringSubstringsMatch	o		o		
10	caseIgnoreListMatch	o		o		
11	caseIgnoreListSubstringsMatch	o		o		
12	booleanMatch	o		o		
13	integerMatch	o		o		
14	integerOrderingMatch	o		o		
15	bitStringMatch	o		o		
16	octetStringMatch	o		o		
17	octetStringOrderingMatch	o		o		
18	octetStringSubstringsMatch	o		o		
19	telephoneNumberMatch	o		o		
20	telephoneNumberSubstringsMatch	o		o		
21	presentationAddressMatch	o		o		
22	uniqueMemberMatch	o		o		
23	protocolInformationMatch	o		o		
24	uTCTimeMatch	o		o		
25	uTCTimeOrderingMatch	o		o		
26	generalizedTimeMatch	o		o		
27	generalizedTimeOrderingMatch	o		o		
28	integerFirstComponentMatch	o		o		
29	objectIdentifierFirstComponentMatch	o		o		
30	directoryStringFirstComponentMatch	o		o		
31	wordMatch	o		o		
32	keywordMatch	o		o		

A.6.4.5 Name Forms (Ref. X.521 | 9594-7)

The supplier of the implementation shall indicate, in the following table, the Name Forms defined in ITU-T Rec. X.521 | ISO/IEC 9594-7 for which support is claimed:

Item No.	Name Forms	DUA		DSA		Note
		Status	Support	Status	Support	
1	countryNameForm	o		o		
2	locNameForm	o		o		
3	sOPNameForm	o		o		
4	orgNameForm	o		o		
5	orgUnitNameForm	o		o		
6	personNameForm	o		o		
7	orgPersonNameForm	o		o		
8	orgRoleNameForm	o		o		
9	gONNameForm	o		o		
10	resPersonNameForm	o		o		
11	applProcessNameForm	o		o		
12	applEntityNameForm	o		o		
13	dSASNameForm	o		o		
14	deviceNameForm	o		o		

A.6.4.6 Information Framework (Ref. X.501 | 9594-2, 13)

The supplier of the implementation shall indicate, in the following table, the object class, attributes, and matching rules defined in ITU-T Rec. X.501 | ISO/IEC 9594-2, Information Framework for which support is claimed.

A.6.4.6.1 Information Framework Object Classes

Prerequisite: [Subentries]

Item No.	Object class	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	subentry	m		m			
2	accessControlSubentry	c27		c28			
3	collectiveAttributeSubentry	c29		c29			
c27: If [SAC-DUA or BAC-DUA] then support of this feature is m else o. c28: If [SAC-DSA or BAC-DSA] then support of this feature is m else o. c29: If [Coll-Attr] then support of this feature is m else o.							

A.6.4.6.2 Information Framework Attributes

Item No.	Attribute Type	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	createTimestamp	o		o			
2	modifyTimestamp	o		o			
3	creatorsName	o		o			
4	modifiersName	o		o			
5	administrativeRole	m		m			
6	subtreeSpecification	c30		c30			
7	collectiveExclusions	o		o			
c30: If [Subentries] then support of this feature is m else o.							

A.6.4.6.3 Information Framework Matching Rules

Item No.	Matching rule	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	objectIdentifierMatch	o		o			
2	distinguishedNameMatch	o		o			

A.6.4.6.4 Information Framework Name Forms

Item No.	Name Form	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	subentryNameForm	m		m			

A.6.4.7 Subschema Administration (Ref. X.501 | 9594-2, 14)

If the supplied implementation supports the subschema administration for its portion of the DSA claimed in A.6.2.1.1/11, then A.6.4.6.1, A.6.4.6.2, A.6.4.6.3 and A.6.4.6.4 are required to be answered by the supplier.

A.6.4.7.1 Subschema Administration Object Classes

Item No.	Object class	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	subschema	c31		c31			
c31: If [SubSchema] then support of this feature is m else o.							

A.6.4.7.2 Subschema Administration Attributes

Item No.	Attribute Type	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	dITStructureRules	c31		c31			
2	dITContentRules	c31		c31			
3	matchingRules	c31		c31			
4	attributeTypes	c31		c31			
5	objectClasses	c31		c31			
6	nameForms	c31		c31			
7	matchingRuleUse	o		o			
8	structuralObjectClass	c31		c31			
9	governingStructureRule	c31		c31			
c31: If [SubSchema] then support of this feature is m else o.							

A.6.4.7.3 Subschema Administration Matching Rules

None.

A.6.4.8 Access Control (Ref. X.501 | 9594-2, 16)**A.6.4.8.1 Access Control Object Classes**

None.

A.6.4.8.2 Access Control Attributes

Prerequisite: [SAC-DUA or BAC-DUA or SAC-DSA or BAC-DSA]

Item No.	Attribute Type	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	accessControlScheme	m		m			
2	prescriptiveACI	m		m			
3	entryACI	c32		c33			
4	subentryACI	m		m			
c32: If [BAC-DUA] then support of this feature is m else o. c33: If [BAC-DSA] then support of this feature is m else o.							

A.6.4.8.3 Access Control Matching

None.

A.6.4.9 DSA Operational Attributes (Ref. X.501 | 9594-2, 20.2)**A.6.4.9.1 DSA Operational Attribute Object Classes**

None.

A.6.4.9.2 DSA Operational Attribute Types

Item No.	Attribute Type	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	dseType	o		o			
2	myAccessPoint	o		o			
3	superiorKnowledge	o		o			
4	specificKnowledge	o		o			
5	nonSpecificKnowledge	o		o			
6	supplierKnowledge	–		–			
7	consumerKnowledge	–		–			
8	secondaryShadows	o		o			

A.6.4.9.3 DSA Operational Matching

Item No.	Matching Rule	DUA		DSA		Predicate	Note
		Status	Support	Status	Support		
1	accessPointMatch	m		m			
2	masterAndShadowAccessPointsMatch	–		–			
3	supplierOrConsumerInformationMatch	–		–			
4	supplierAndConsumersMatch	–		–			

A.6.5 Supported ISO/IEC 10646-1 Character Sets (Ref. ISO/IEC 10646-1)

Prerequisite: [BMP or UCS]

A.6.5.1 Basic Multilingual Plane (BMP)

Prerequisite: [BMP]

The supplier of the implementation shall indicate, in the table below, support for the Basic Multilingual Plane Character Sets, defined in ISO/IEC 10646-1 as amended, for which conformance is claimed.

A.6.5.1.1 Required BMP Support

Item No.	Block Name	DUA		DSA		Note
		Status	Support	Status	Support	
1	Basic Latin	m		m		

A.6.5.1.2 Other Supported BMP Character Sets

Prerequisite: [BMP]

The supplier of the implementation is required to list, in the following table, any other BMP Character Sets, as defined in clause 19 of ISO/IEC 10646-1, for which conformance is claimed:

Index	Block Names	
	DUA	DSA

A.6.5.1.3 BMP Level Support

Prerequisite: [BMP]

The supplier of the implementation shall indicate, in the table below, support for the Implementation Level, defined in clause 15 of ISO/IEC 10646-1, of the BMP Character Sets listed in Tables A.6.5.1.1 and A.6.5.1.2.

Item No.	Level	DUA		DSA		Note
		Status	Support	Status	Support	
1	Level 1	m		m		
2	Level 2	o		o		
3	Level 3	o		o		

A.6.5.2 Universal Character Set (UCS)

Prerequisite: [UCS]

The supplier of the implementation shall indicate, in the table below, support for the Universal Character Set character sets, defined in ISO/IEC 10646-1 as amended, for which conformance is claimed.

A.6.5.2.1 Required UCS Support

Prerequisite: [UCS]

Item No.	Plane	Group	Block Name	DUA		DSA		Note
				Status	Support	Status	Support	
1	00	00	Basic Latin	m		m		

A.6.5.2.2 Other Supported UCS Character Sets

Prerequisite: [UCS]

The supplier of the implementation is required to list, in the following table, any other UCS Character Sets, for which conformance is claimed:

Index	DUA			DSA		
	Plane	Group	Block Name	Plane	Group	Block Name

A.6.5.2.3 UCS Level Support

Prerequisite: [UCS]

The supplier of the implementation shall indicate, in the table below, support for the Implementation Level, defined in clause 15 of ISO/IEC 10646-1, of the UCS Character Sets listed in Tables A.6.5.2.1 and A.6.5.2.2.

Item No.	Level	DUA		DSA		Note
		Status	Support	Status	Support	
1	Level 1	m		m		
2	Level 2	o		o		
3	Level 3	o		o		

A.6.6 Other information

The following table can be used to provide any other relevant information.

Index	Other information

SERIES DE RECOMENDACIONES DEL UIT-T

Serie A	Organización del trabajo del UIT-T
Serie B	Medios de expresión: definiciones, símbolos, clasificación
Serie C	Estadísticas generales de telecomunicaciones
Serie D	Principios generales de tarificación
Serie E	Explotación general de la red, servicio telefónico, explotación del servicio y factores humanos
Serie F	Servicios de telecomunicación no telefónicos
Serie G	Sistemas y medios de transmisión, sistemas y redes digitales
Serie H	Sistemas audiovisuales y multimedios
Serie I	Red digital de servicios integrados
Serie J	Transmisiones de señales radiofónicas, de televisión y de otras señales multimedios
Serie K	Protección contra las interferencias
Serie L	Construcción, instalación y protección de los cables y otros elementos de planta exterior
Serie M	RGT y mantenimiento de redes: sistemas de transmisión, circuitos telefónicos, telegrafía, facsímil y circuitos arrendados internacionales
Serie N	Mantenimiento: circuitos internacionales para transmisiones radiofónicas y de televisión
Serie O	Especificaciones de los aparatos de medida
Serie P	Calidad de transmisión telefónica, instalaciones telefónicas y redes locales
Serie Q	Conmutación y señalización
Serie R	Transmisión telegráfica
Serie S	Equipos terminales para servicios de telegrafía
Serie T	Terminales para servicios de telemática
Serie U	Conmutación telegráfica
Serie V	Comunicación de datos por la red telefónica
Serie X	Redes de datos y comunicación entre sistemas abiertos
Serie Y	Infraestructura mundial de la información
Serie Z	Lenguajes de programación