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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 sistema de
directorio**

Recomendación UIT-T X.584

(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 13248-2

RECOMENDACIÓN UIT-T X.584

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

Resumen

Esta Recomendación | Norma Internacional contiene el formulario de PICS para el protocolo de sistema de directorio (DSP) 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 sistema de directorio (DSA).

Orígenes

El texto de la Recomendación UIT-T X.584 se aprobó el 12 de diciembre de 1997. Su texto se publica también, en forma idéntica, como Norma Internacional ISO/CEI 13248-2.

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.

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ÍNDICE

	<i>Página</i>
1 Alcance	1
2 Referencias normativas	1
2.1 Recomendaciones UIT-T Normas Internacionales idénticas.....	1
2.2 Pares de Recomendaciones y Normas Internacionales con contenido técnico equivalente.....	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.....	4
6 Conformidad	4
Anexo A – Protocolo de sistema de directorio – Formulario de enunciado de conformidad de implementación de protocolo (PICS)	5
A.1 Identification of the ICS proforma corrigenda.....	5
A.2 Instructions	5
A.2.1 Purpose and structure of the proforma	5
A.2.2 Symbols, terms, and abbreviations.....	5
A.2.2.1 Introduction.....	5
A.2.2.2 Prerequisite notation	6
A.2.2.3 Item reference numbers.....	6
A.2.2.4 Status column.....	6
A.2.2.5 Support column.....	6
A.2.2.6 Definition of support.....	7
A.2.2.7 Predicate column.....	7
A.2.2.8 Predicate Name	7
A.2.2.9 Note column.....	7
A.2.3 Instructions for completing the PICS proforma	7
A.3 Identification of the implementation.....	8
A.3.1 Identification of PICS	8
A.3.2 Identification of the implementation and/or system.....	8
A.3.3 Identification of the system supplier	8
A.3.4 Identification of the testlab client.....	9
A.4 Identification of the protocol	9
A.5 Identification of corrigenda to the protocol	10
A.6 ICS proforma tables	10
A.6.1 Roles	10
A.6.2 General capabilities and global statement of conformance	10
A.6.2.1 General capabilities.....	11
A.6.2.2 Supported Security Levels	11
A.6.2.3 Supported Access Control Schemes.....	11
A.6.3 Capabilities and options.....	12
A.6.3.1 Supported application context.....	12
A.6.3.2 Operations and extensions	12
A.6.3.3 Protocol Elements	13

	<i>Página</i>
A.6.4 Directory schema and Directory System Schema	39
A.6.4.1 Supported Object Classes (Ref. X.521 9594-7)	39
A.6.4.2 Directory String Types (Ref. X.520 9594-6).....	40
A.6.4.3 Supported Attribute Types	40
A.6.4.4 Matching Rules (Ref. X.521 9594-7).....	43
A.6.4.5 Name Forms (Ref. X.521 9594-7).....	44
A.6.4.6 Information Framework (Ref. X.501 9594-2, 13).....	44
A.6.4.7 Subschema Administration (Ref. X.501 9594-2, 14)	45
A.6.4.8 Access Control (Ref. X.501 9594-2, 16).....	46
A.6.4.9 DSA Operational Attributes (Ref. X.501 9594-2, 20).....	46
A.6.5 Other information.....	47

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 sistema de directorio (DSP), 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 sistema 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 SISTEMA DE DIRECTORIO

1 Alcance

Esta Recomendación | Norma Internacional contiene el formulario de PICS para el protocolo de sistema de directorio (DSP, *directory system 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 DSP 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 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 y Normas Internacionales de 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*.

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

En la presente Recomendación | Norma Internacional se utilizan los términos siguientes definidos en la Rec. 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 agente de sistema de directorio iniciador: Primer DSA de varios DSA que cooperan para cursar una petición de usuario. Véanse las figuras 1 y 2.

3.3.5 agente de sistema de directorio relevador: DSA que inicia una operación encadenada a consecuencia de un relevo en la fase de resolución de nombre. Véase la figura 2.

3.3.6 agente de sistema de directorio respondedor: DSA que procesa una petición y genera un resultado o error. Véanse las figuras 1 y 2.

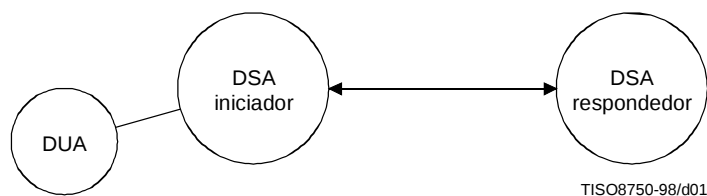


Figura 1

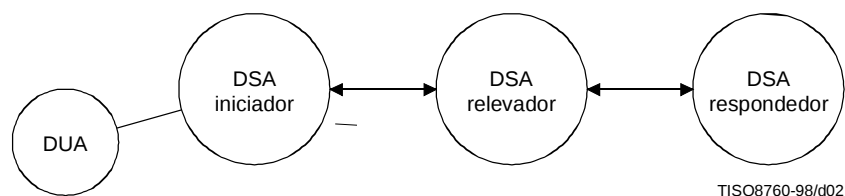


Figura 2

3.3.7 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.

- 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".
- para la autenticación de entidad par hay tres niveles de seguridad, a saber, "ninguno", "simple con nombre distinguido" y "fuerte".
- 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>)
CEI	Comisión Electrotécnica Internacional
CCITT	Comité Consultivo Internacional Telegráfico y Telefónico
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
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 de la UIT

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 sistema de 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.584 (1997) ISO/IEC 13248-2:1998
	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.

¹⁾ **Comunicado sobre derechos de autor del formulario 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.2.2.1.3 status (value): An allowed entry in the status column for an item in a PICS proforma table.

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

A.2.2.2 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 "Initiator", "Responder", or "Relay" identifies whether the implementation is an Initiator, Responder, or Relay DSA.

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

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

- to generate the corresponding operation parameters (either automatically or because the invoker explicitly requires that capability);
- to interpret, handle and, when required, make available to the invoker the corresponding error or result.

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

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

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

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 Initiator, Responder, or Relay DSA but only applies for the type of DSA claiming support. For example, in an implementation which includes both an Initiator and a Responder DSA, if the Responder DSA supports the ChainedRead operation (which is mandatory for a Responder DSA), the "Read" predicate will be set for the Responder DSA only. If the ChainedRead operation is also supported for the Initiator DSA (which is optional), the predicate would be set for both the Initiator and Responder DSAs.

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	Special Configuration	Note
8	Other information	
NOTE – Shall be a "cooperating" DSA as defined in clause 3 of this PICS. Other responses may be given, provided they do not conflict with other parts of the conformance statement. Some examples of other configurations: – Chaining DSAs; – First-level DSAs.		

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, Information technology – Open Systems Interconnection – The Directory: Overview of concepts, models and services	
2	ITU-T Rec. X.501 (1993) ISO/IEC 9594-2:1995, Information technology – Open Systems Interconnection – The Directory: Models	
3	ITU-T Rec. X.509 (1993) ISO/IEC 9594-8:1995, Information technology – Open Systems Interconnection – The Directory: Authentication framework	
4	ITU-T Rec. X.511 (1993) ISO/IEC 9594-3:1995, Information technology – Open Systems Interconnection – The Directory: Abstract service definition	
5	ITU-T Rec. X.518 (1993) ISO/IEC 9594-4:1995, Information technology – Open Systems Interconnection – The Directory: Procedures for distributed operations	
6	ITU-T Rec. X.519 (1993) ISO/IEC 9594-5:1995, Information technology – Open Systems Interconnection – The Directory: Protocol specifications	
7	ITU-T Rec. X.520 (1993) ISO/IEC 9594-6:1995, Information technology – Open Systems Interconnection – The Directory: Selected attribute Types	
8	ITU-T Rec. X.521 (1993) ISO/IEC 9594-7:1995, Information technology – Open Systems Interconnection – The Directory: Selected object classes	
9	ITU-T Rec. X.525 (1993) ISO/IEC 9594-9:1995, Information technology – Open Systems Interconnection – The Directory: Replication	

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	Cooperating DSA	m		
2	Chaining DSA	o		
3	First-level DSA	o		*FirstLevel-DSA
4	Relay DSA	o		

A.6.2 General capabilities and global statement of conformance

Answering "No" to A.6.2.1/1 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.6.5 "Other information". Parts of the PICS proforma tables are defined by the DSA role (initiator, relay, or responder) and by the type of operation (signed or unsigned). The Supplier of the implementation shall answer the appropriate columns for which support is being claimed.

A.6.2.1 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 minimum knowledge requirements (ITU-T Rec. X.501 ISO/IEC 9594-2) implemented?	m		
4	Supported Reference(s)	Superior Reference	m	
		Subordinate Reference	m	
		Cross Reference	o	
		Non-Specific Subordinate Reference	o	
		Immediate Superior Reference	o	
5	Is asynchronous (ROSE class 2) mode of operation supported?	m		
6	Does the DSA follow the rules of extensibility as defined in 7.5 of ITU-T Rec. X.519 ISO/IEC 9594-5?	m		
7	Is the alias mechanism implemented?	m		
8	Does the DSA support the application-context(s) directorySystemAC?	m		
9	Is the DSA capable of supporting collective attributes?	o		*Coll-Attr
10	Is the DSA capable of supporting hierarchical attributes (Subtypes)?	o		*Hier-Attr
11	Is the DSA capable of supporting auxiliary object classes?	o		
12	Is the DSA capable of supporting the subschema administrative operational attributes?	o		*SubSchema
13	Does the DSA support signed DSP operations and results?	o		*Signed-Ops
14	Does the DSA support NSSR?	o		*NSSR
c1: If [FirstLevel-DSA] then m else i.				

A.6.2.2 Supported Security Levels

Item No.	Security Level	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.6.2.3 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.6.3 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.

The ICS tables are divided into Initiator, Responder, and Relay columns. Suppliers of implementations claiming conformance as Initiator, Responder, and/or Relay DSAs should supply responses to the appropriate status/support columns under the appropriate DSA type.

A.6.3.1 Supported application context

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

A.6.3.2 Operations and extensions

A.6.3.2.1 Operations (Ref. X.511 | 9594-3)

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate Name	Note
		Status	Support	Status	Support	Status	Support		
1	DirectoryBind	m		m		m			
2	DirectoryUnbind	m		m		m			
3	ChainedRead	o		m		m		*Read	
4	ChainedCompare	o		m		m		*Compare	
5	ChainedAbandon	o		m		m		*Abandon	
6	ChainedList	o		m		m		*List	
7	ChainedSearch	o		m		m		*Search	
8	ChainedAddEntry	o		m		m		*AddEntry	
9	ChainedRemoveEntry	o		m		m		*RemoveEntry	
10	ChainedModifyEntry	o		m		m		*ModifyEntry	
11	ChainedModifyDN	o		m		m		*ModifyDN	Note
NOTE – 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.	Protocol Element	Initiator		Responder		Relay		Predicate Name	Note
		Status	Support	Status	Support	Status	Support		
1	subentries	o		o		o		*Subentries	
2	copyShallDo	o		o		o		*copyshalldo	
3	attributesizelimit	o		o		o		*attrsizelimit	
4	extraAttributes	o		o		o		*extraAttr	
5	modifyRightsRequest	o		o		o		*modrightsreq	
6	pagedResultsRequest	–		–		–			
7	matchValuesOnly	o		o		o		*matchvalonly	
8	extendedFilter	o		o		o		*extfilter	
9	targetSystem	o		o		o		*targetsystem	
10	useAliasOnUpdate	o		o		o			
11	newSuperior	o		o		o		*newsuperior	

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 Initiator, Responder, and Relay DSAs 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 DSA Bind Elements (Ref. X.511 | 9594-3, 8.1)

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

Item No.	Protocol Element	Status	Support	Predicate	Note
1	credentials	c2			
1.1	simple	c:c3			
1.1.1	name	c:m			
1.1.2	validity	c:o			
1.1.2.1	time1	c:o			
1.1.2.2	time2	c:o			
1.1.2.3	random1	c:o			
1.1.2.4	random2	c:o			
1.1.3	password	c:o		*Password	
1.1.3.1	unprotected	c:o.2			
1.1.3.2	protected	c:o.2			
1.1.3.2.1	algorithmIdentifier	c:m		*Algor-ID	See A.6.3.3.28.2
1.1.3.2.2	encrypted	c:m			
1.2	strong	c:c4			
1.2.1	certification-path	c:o		*Cert-Path	See A.6.3.3.28
1.2.2	bind-token	c:m			
1.2.2.1	toBeSigned	c:m			
1.2.2.1.1	algorithm	c:m			
1.2.2.1.2	name	c:m			
1.2.2.1.3	time	c:m			
1.2.2.1.4	random	c:m			
1.2.2.2	algorithmIdentifier	c:m		*Algor-ID	See A.6.3.3.28.2
1.2.2.3	encrypted	c:m			
1.2.3	name	c:o			
1.3	externalProcedure	i			
2	versions	m			d(v1)
2.1	v1	m			
c2: If [Simple-DSA or Strong-DSA] then support of this feature is m else o. c3: If [Simple-DSA] then support of this feature is m else o. c4: If [Strong-DSA] then support of this feature is m else o. o.2: At least one of the items must be supported.					

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

Item No.	Protocol Element	Status	Support	Predicate	Notes
1	credentials	c2			
1.1	simple	c:c3			
1.1.1	name	c:m			
1.1.2	validity	c:o			
1.1.2.1	time1	c:o			
1.1.2.2	time2	c:o			
1.1.2.3	random1	c:o			
1.1.2.4	random2	c:o			
1.1.3	password	c:o		*Password	
1.1.3.1	unprotected	c:o.2			
1.1.3.2	protected	c:o.2			
1.1.3.2.1	algorithmIdentifier	c:m		*Algor-ID	See A.6.3.3.28.2
1.1.3.2.2	encrypted	c:m			
1.2	strong	c: c4			
1.2.1	certification-path	c:o		*Cert-Path	See A.6.3.3.28
1.2.2	bind-token	c:m			
1.2.2.1	toBeSigned	c:m			
1.2.2.1.1	algorithm	c:m			
1.2.2.1.2	name	c:m			
1.2.2.1.3	time	c:m			
1.2.2.1.4	random	c:m			
1.2.2.2	algorithmIdentifier	c:m		*Algor-ID	See A.6.3.3.28.2
1.2.2.3	encrypted	c:m			
1.2.3	name	c:o			
1.3	externalProcedure	i			
2	versions	m			d(v1)
2.1	v1	m			
c2: If [Simple-DSA or Strong-DSA] then support of this feature is m else o. c3: If [Simple-DSA] then support of this feature is m else o. c4: If [Strong-DSA] then support of this feature is m else o. o.2: At least one of the items must be supported.					

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

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

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

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

A.6.3.3.3 Chained Read Elements (Ref. X.518 | 9594-4, 12.1)

Prerequisite: [Read]

Item No.	Protocol Element	Initiator				Responder				Relay				Predicate	Note
		Unsigned		Signed		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support	Status	Support	Status	Support		
1	chainedReadArgument	m		m		m		m		m		m			
1.1	ToBeSigned	–		m		–		m		–		m			
1.2	ChainingArguments	m		m		m		m		m		m		*Chain-Arg	See A.6.3.3.22
1.3	ReadArgument	m		m		m		m		m		m			Note 1
1.3.1	ToBeSigned	–		m		–		m		m		m			
1.3.2	object	m		m		m		m		m		m			
1.3.3	selection	m		m		m		m		m		m			d({})
1.3.4	modifyRightsRequest	m		m		c5		c5		m		m			d(false)
1.3.5	CommonArguments	m		m		m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.3.6	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
1.3.7	encrypted	–		m		–		m		m		m			
1.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
1.5	encrypted	–		m		–		m		–		m			
2	chainedReadResult	m		m		m		m		m		m			
2.1	toBeSigned	–		m		–		m		–		m			
2.2	ChainingResults	m		m		m		m		m		m		*Chain-Res	See A.6.3.3.23
2.3	ReadResult	m		m		m		m		m		m			Note 2
2.3.1	toBeSigned	–		m		–		m		m		m			
2.3.2	entry	m		m		m		m		m		m			
2.3.3	modifyRights	m		m		c5		c5		m		m			
2.3.3.1	item	m		m		c:m		c:m		m		m			
2.3.3.1.1	entry	m		m		c:o		c:o		m		m			
2.3.3.1.2	attribute	m		m		c:o		c:o		m		m			
2.3.3.1.3	value	m		m		c:o		c:o		m		m			
2.3.3.2	permission	m		m		c:o		c:o		m		m			
2.3.4	commonResults	m		m		m		m		m		m		*Comm-Res	See A.6.3.3.14
2.3.5	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
2.3.6	encrypted	–		m		–		m		m		m			
2.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
2.5	encrypted	–		m		–		m		–		m			
3	Errors	m		m		m		m		m		m			See A.6.3.3.12

c5: If [modrightsreq] then support of this feature is m else o.

NOTE 1 – The original operation argument and signature are defined in DAP. They should be passed unaltered by DSP.

NOTE 2 – The original operation result and signature are defined in DAP. They should be passed unaltered by DSP.

A.6.3.3.4 Chained Compare Elements (Ref. X.518 | 9594-4, 12.1)

Prerequisite: [Compare]

Item No.	Protocol Element	Initiator				Responder				Relay				Predicate	Note
		Unsigned		Signed		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support	Status	Support	Status	Support		
1	chainedCompareArgument	m		m		m		m		m		m			
1.1	ToBeSigned	–		m		–		m		–		m			
1.2	ChainingArguments	m		m		m		m		m		m		*Chain-Arg	See A.6.3.3.22
1.3	CompareArgument	m		m		m		m		m		m			
1.3.1	ToBeSigned	–		m		–		m		m		m			
1.3.2	object	m		m		m		m		m		m			
1.3.3	purported	m		m		m		m		m		m			
1.3.4	CommonArguments	m		m		m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.3.5	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
1.3.6	encrypted	–		m		–		m		m		m			
1.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
1.5	encrypted	–		m		–		m		–		m			
2	chainedCompareResult	m		m		m		m		m		m			
2.1	ToBeSigned	–		m		–		m		–		m			
2.2	ChainingResults	m		m		m		m		m		m		*Chain-Res	See A.6.3.3.23
2.3	CompareResult	m		m		m		m		m		m			
2.3.1	ToBeSigned	–		m		–		m		–		m			
2.3.2	name	m		m		m		m		m		m			
2.3.3	matched	m		m		m		m		m		m			
2.3.4	fromEntry	m		m		m		m		m		m			d(true)
2.3.5	matchedSubtype	c6		c6		c6		c6		c6		c6			
2.3.6	CommonResults	m		m		m		m		m		m		*Comm-Res	See A.6.3.3.14
2.3.7	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
2.3.8	encrypted	–		m		–		m		m		m			
2.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
2.5	encrypted	–		m		–		m		–		m			
3	Errors	m		m		m		m		m		m			See A.6.3.3.12
c6: If [Hier-Attr] then support of this feature is m else o.															

A.6.3.3.5 Chained Abandon Elements (Ref. X.518 | 9594-4, 12.2)

Prerequisite: [Abandon]

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	AbandonArgument	m		m		m			
1.1	invokeID	m		m		m			
2	AbandonResult	m		m		m			
3	Errors	m		m		m			AbandonFailederror

A.6.3.3.6 Chained List Elements (Ref. X.518 | 9594-4, 12.1)

Prerequisite: [List]

Item No.	Protocol Element	Initiator				Responder				Relay				Predicate	Note
		Unsigned		Signed		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support	Status	Support	Status	Support		
1	chainedListArgument	m		m		m		m		m		m			
1.1	ToBeSigned	–		m		–		m		–		m			
1.2	ChainingArguments	m		m		m		m		m		m		*Chain-Arg	See A.6.3.3.22
1.3	ListArgument	m		m		m		m		m		m			
1.3.1	ToBeSigned	–		m		–		m		m		m			
1.3.2	object	m		m		m		m		m		m			
1.3.3	pagedResults	–		–		–		–		–		–			
1.3.4	CommonArguments	m		m		m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.3.5	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
1.3.6	encrypted	–		m		–		m		m		m			
1.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
1.5	encrypted	–		m		–		m		–		m			
2	chainedListResult	m		m		m		m		m		m			
2.1	ToBeSigned	–		m		–		m		–		m			
2.2	ChainingResults	m		m		m		m		m		m		*Chain-Res	See A.6.3.3.23

A.6.3.3.6 Chained List Elements (Ref. X.518 | 9594-4, 12.1) (*continued*)

Prerequisite: [List]

Item No.	Protocol Element	Initiator				Responder				Relay				Predicate	Note
		Unsigned		Signed		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support	Status	Support	Status	Support		
2.3	ListResult	m		m		m		m		m		m			
2.3.1	ToBeSigned	–		m		–		m		m		m			
2.3.2	listInfo	m		m		m		m		m		m			
2.3.2.1	name	m		m		m		m		m		m			
2.3.2.2	subordinates	m		m		m		m		m		m			
2.3.2.2.1	rdn	m		m		m		m		m		m			
2.3.2.2.2	aliasEntry	m		m		m		m		m		m			d(false)
2.3.2.2.3	fromEntry	m		m		m		m		m		m			d(true)
2.3.2.3	partialOutcomeQualifier	m		m		m		m		m		m			
2.3.2.3.1	limitProblem	m		m		m		m		m		m			
2.3.2.3.1.1	timeLimitExceeded	m		m		m		m		m		m			
2.3.2.3.1.2	sizeLimitExceeded	m		m		m		m		m		m			
2.3.2.3.1.3	administrativeLimitExceeded	m		m		m		m		m		m			
2.3.2.3.2	unexplored	m		m		m		m		m		m			See A.6.3.3.21
2.3.2.3.3	unavailableCriticalExt	m		m		m		m		m		m			d(false)
2.3.2.3.4	unknownErrors	m		m		m		m		m		m			
2.3.2.3.5	queryReference	–		–		–		–		–		–			
2.3.2.4	CommonResults	m		m		m		m		m		m		*Comm-Res	See A.6.3.3.14
2.3.3	uncorrelatedListInfo	m		m		m		m		m		m			
2.3.4	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
2.3.5	encrypted	–		m		–		m		m		m			
2.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
2.5	encrypted	–		m		–		m		–		m			
3	Errors	m		m		m		m		m		m			See A.6.3.3.12

A.6.3.3.7 Chained Search Elements (Ref. X.518 | 9594-4, 12.1)

Prerequisite: [Search]

Item No.	Protocol Element	Initiator				Responder				Relay				Predicate	Note
		Unsigned		Signed		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support	Status	Support	Status	Support		
1	chainedSearchArgument	m		m		m		m		m		m			
1.1	ToBeSigned	–		m		–		m		–		m			
1.2	ChainingArguments	m		m		m		m		m		m		*Chain-Arg	See A.6.3.3.22
1.3	SearchArgument	m		m		m		m		m		m			
1.3.1	ToBeSigned	–		m		–		m		m		m			
1.3.2	baseObject	m		m		m		m		m		m			
1.3.3	subset	m		m		m		m		m		m			d({})
1.3.4	filter	m		m		m		m		m		m		*Filter	d(and {}), See A.6.3.3.18
1.3.5	searchAlias	m		m		m		m		m		m			d(true)
1.3.6	selection	m		m		m		m		m		m		*Info-Sel	d({}), See A.6.3.3.16
1.3.7	pagedResults	–		–		–		–		–		–			
1.3.8	matchValuesOnly	c7		c7		c7		c7		c7		c7			d(false)
1.3.9	extendedFilter	c8		c8		c8		c8		c8		c8			See A.6.3.3.18
1.3.10	CommonArguments	m		m		m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.3.11	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
1.3.12	encrypted	–		m		–		m		m		m			
1.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
1.5	encrypted	–		m		–		m		–		m			
2	chainedSearchResult	m		m		m		m		m		m			
2.1	ToBeSigned	–		m		–		m		–		m			
2.2	ChainingResults	m		m		m		m		m		m		*Chain-Res	See A.6.3.3.23

A.6.3.3.7 Chained Search Elements (Ref. X.518 | 9594-4, 12.1) (*continued*)

Prerequisite: [Search]

Item No.	Protocol Element	Initiator				Responder				Relay				Predicate	Note
		Unsigned		Signed		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support	Status	Support	Status	Support		
2.3	SearchResult	m		m		m		m		m		m			
2.3.1	ToBeSigned	–		m		–		m		m		m			
2.3.2	searchInfo	m		m		m		m		m		m			
2.3.2.1	name	m		m		m		m		m		m			
2.3.2.2	entries	m		m		m		m		m		m		*Entry-Info	See A.6.3.3.17
2.3.2.3	PartialOutcomeQualifier	m		m		m		m		m		m			
2.3.2.3.1	limitProblem	m		m		m		m		m		m			
2.3.2.3.1.1	timeLimitExceeded	m		m		m		m		m		m			
2.3.2.3.1.2	sizeLimitExceeded	m		m		m		m		m		m			
2.3.2.3.1.3	administrativeLimitExceeded	m		m		m		m		m		m			
2.3.2.3.2	unexplored	m		m		m		m		m		m			See A.6.3.3.20
2.3.2.3.3	unavailableCriticalExt	m		m		m		m		m		m			
2.3.2.3.4	unknownErrors	m		m		m		m		m		m			
2.3.2.3.5	queryReference	–		–		–		–		–		–			
2.3.2.4	CommonResults	m		m		m		m		m		m		*Comm-Res	See A.6.3.3.14
2.3.3	uncorrelatedSearchInfo	m		m		m		m		m		m			
2.3.4	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
2.3.5	encrypted	–		m		–		m		m		m			
2.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
2.5	encrypted	–		m		–		m		–		m			
3	Errors	m		m		m		m		m		m			See A.6.3.3.12
c7: If [matchvalonly] then support of this feature is m else o.															
c8: If [extfilter] then support of this feature is m else o.															

A.6.3.3.8 Chained Add Entry Elements (Ref. X.518 | 9594-4, 12.1)

Prerequisite: [AddEntry]

Item No.	Protocol Element	Initiator				Responder				Relay				Predicate	Note
		Unsigned		Signed		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support	Status	Support	Status	Support		
1	chainedAddEntryArgument	m		m		m		m		m		m			
1.1	ToBeSigned	–		m		–		m		–		m			
1.2	ChainingArguments	m		m		m		m		m		m		*Chain-Arg	See A.6.3.3.22
1.3	AddEntryArgument	m		m		m		m		m		m			
1.3.1	ToBeSigned	–		m		–		m		m		m			
1.3.2	object	m		m		m		m		m		m			
1.3.3	entry	m		m		m		m		m		m			
1.3.4	targetSystem	c9		c9		c9		c9		c9		c9			See A.6.3.3.26
1.3.5	CommonArguments	m		m		m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.3.6	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
1.3.7	encrypted	–		m		–		m		m		m			
1.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
1.5	encrypted	–		m		–		m		–		m			
2	chainedAddEntryResult	m		m		m		m		m		m			
2.1	ToBeSigned	–		m		–		m		–		m			
2.2	ChainingResults	m		m		m		m		m		m		*Chain-Res	See A.6.3.3.23
2.3	AddEntryResult	m		m		m		m		m		m			
2.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
2.5	encrypted	–		m		–		m		–		m			
3	Errors	m		m		m		m		m		m			See A.6.3.3.12
c9: If [targetsystem] then support of this feature is m else o.															

A.6.3.3.9 Chained Remove Entry Elements (Ref. X.518 | 9594-4, 12.1)

Prerequisite: [RemoveEntry]

Item No.	Protocol Element	Initiator				Responder				Relay				Predicate	Note
		Unsigned		Signed		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support	Status	Support	Status	Support		
1	chainedRemoveEntry	m		m		m		m		m		m			
1.1	ToBeSigned	–		m		–		m		–		m			
1.2	ChainingArguments	m		m		m		m		m		m		*Chain-Arg	See A.6.3.3.22
1.3	RemoveEntryArgument	m		m		m		m		m		m			
1.3.1	ToBeSigned	–		m		–		m		m		m			
1.3.2	object	m		m		m		m		m		m			
1.3.3	CommonArguments	m		m		m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.3.4	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
1.3.5	encrypted	–		m		–		m		m		m			
1.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
1.5	encrypted	–		m		–		m		–		m			
2	chainedRemoveEntryResult	m		m		m		m		m		m			
2.1	ToBeSigned	–		m		–		m		–		m			
2.2	ChainingResults	m		m		m		m		m		m		*Chain-Res	See A.6.3.3.23
2.3	RemoveEntryResult	m		m		m		m		m		m			NULL
2.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
2.5	encrypted	–		m		–		m		–		m			
3	Errors	m		m		m		m		m		m			See A.6.3.3.12

A.6.3.3.10 Chained Modify Entry Elements (Ref. X.518 | 9594-4, 12.1)

Prerequisite: [ModifyEntry]

Item No.	Protocol Element	Initiator				Responder				Relay				Predicate	Note
		Unsigned		Signed		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support	Status	Support	Status	Support		
1	chainedModifyEntryArgument	m		m		m		m		m		m			
1.1	ToBeSigned	–		m		–		m		–		m			
1.2	ChainingArguments	m		m		m		m		m		m		*Chain-Arg	See A.6.3.3.22
1.3	ModifyEntryArgument	m		m		m		m		m		m			
1.3.1	ToBeSigned	–		m		–		m		m		m			
1.3.2	object	m		m		m		m		m		m			
1.3.3	changes	m		m		m		m		m		m			
1.3.3.1	addAttribute	m		m		m		m		m		m			
1.3.3.2	removeAttribute	m		m		m		m		m		m			
1.3.3.3	addValues	m		m		m		m		m		m			
1.3.3.4	removeValues	m		m		m		m		m		m			
1.3.4	CommonArguments	m		m		m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.3.5	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
1.3.6	encrypted	–		m		–		m		m		m			
1.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
1.5	encrypted	–		m		–		m		–		m			
2	chainedModifyEntryResult	m		m		m		m		m		m			
2.1	ToBeSigned	–		m		–		m		–		m			
2.2	ChainingResults	m		m		m		m		m		m		*Chain-Res	See A.6.3.3.23
2.3	ModifyEntryResult	m		m		m		m		m		m			NULL
2.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
2.5	encrypted	–		m		–		m		–		m			
3	Errors	m		m		m		m		m		m			See A.6.3.3.12

A.6.3.3.11 Chained ModifyDN Elements (Ref. X.518 | 9594-4, 12.1)

Prerequisite: [ModifyDN]

Item No.	Protocol Element	Initiator				Responder				Relay				Predicate	Note
		Unsigned		Signed		Unsigned		Signed		Unsigned		Signed			
		Status	Support	Status	Support	Status	Support	Status	Support	Status	Support	Status	Support		
1	chainedModifyDNArgument	m		m		m		m		m		m			
1.1	ToBeSigned	–		m		–		m		–		m			
1.2	ChainingArguments	m		m		m		m		m		m		*Chain-Arg	See A.6.3.3.22
1.3	ModifyDNArgume nt	m		m		m		m		m		m			
1.3.1	ToBeSigned	–		m		–		m		m		m			
1.3.2	object	m		m		m		m		m		m			
1.3.3	newRDN	m		m		m		m		m		m			
1.3.4	deleteOldRDN	m		m		m		m		m		m			d(false)
1.3.5	newSuperior	c10		c10		c10		c10		c10		c10			
1.3.6	CommonArgument s	m		m		m		m		m		m		*Comm-Arg	See A.6.3.3.13
1.3.7	algorithmIdentifier	–		m		–		m		m		m		*Algor-ID	See A.6.3.3.28.2
1.3.8	encrypted	–		m		–		m		m		m			
1.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
1.5	encrypted	–		m		–		m		–		m			
2	chainedModifyEntr yResult	m		m		m		m		m		m			
2.1	ToBeSigned	–		m		–		m		–		m			
2.2	ChainingResults	m		m		m		m		m		m		*Chain-Res	See A.6.3.3.23
2.3	ModifyDNResult	m		m		m		m		m		m			NULL
2.4	algorithmIdentifier	–		m		–		m		–		m		*Algor-ID	See A.6.3.3.28.2
2.5	encrypted	–		m		–		m		–		m			
3	Errors	m		m		m		m		m		m			See A.6.3.3.12
c10: If [newsuperior] then support of this feature is m else o.															

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

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	Abandoned	m		m		m			
2	AbandonFailed	m		m		m			
2.1	problem	m		m		m			
2.1.1	noSuchOperation	m		m		m			
2.1.2	tooLate	m		m		m			
2.1.3	cannotAbandon	m		m		m			
2.2	operation	m		m		m			
3	AttributeError	m		m		m			
3.1	object	m		m		m			
3.2	problems	m		m		m			
3.2.1	problem	m		m		m			
3.2.1.1	noSuchAttributeOrValue	m		m		m			
3.2.1.2	invalidAttributeSyntax	m		m		m			
3.2.1.3	undefinedAttributeType	m		m		m			
3.2.1.4	inappropriateMatching	m		m		m			
3.2.1.5	constraintViolation	m		m		m			
3.2.1.6	attributeOrValueAlreadyExists	m		m		m			
3.2.2	type	m		m		m			
3.2.3	value	m		m		m			
4	NameError	m		m		m			
4.1	problem	m		m		m			
4.1.1	noSuchObject	m		m		m			
4.1.2	aliasProblem	m		m		m			
4.1.3	invalidAttributeSyntax	m		m		m			
4.1.4	aliasDereferencingProblem	m		m		m			
4.2	matched	m		m		m			
5	DSASReferral	m		m		m			
5.1	continuationReference	m		m		m			See A.6.3.3.21
5.2	contextPrefix	m		m		m			

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

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
6	SecurityError	m		m		m			
6.1	problem	m		m		m			
6.1.1	InappropriateAuthentication	m		m		m			
6.1.2	invalidCredentials	m		m		m			
6.1.3	insufficientAccessRights	m		m		m			
6.1.4	invalidSignature	m		c11		m			
6.1.5	protectionRequired	m		c11		m			
6.1.6	noInformation	m		m		m			
7	ServiceError	m		m		m			
7.1	problem	m		m		m			
7.1.1	busy	m		m		m			
7.1.2	unavailable	m		m		m			
7.1.3	unwillingToPerform	m		m		m			
7.1.4	chainingRequired	m		m		m			
7.1.5	unableToProceed	m		m		m			
7.1.6	invalidReference	m		m		m			
7.1.7	timeLimitExceeded	m		m		m			
7.1.8	administrativeLimitExceeded	m		m		m			
7.1.9	loopDetected	m		m		m			
7.1.10	unavailableCriticalExtension	m		m		m			
7.1.11	outOfScope	m		m		m			
7.1.12	ditError	m		m		m			
7.1.13	invalidQueryReference	i		i		i			
8	UpdateError	m		m		m			
8.1	problem	m		m		m			
8.1.1	namingViolation	m		m		m			
8.1.2	objectClassViolation	m		m		m			
8.1.3	notAllowedOnNonLeaf	m		m		m			
8.1.4	notAllowedOnRDN	m		m		m			
8.1.5	entryAlreadyExists	m		m		m			
8.1.6	affectsMultipleDSAs	m		m		m			
8.1.7	objectClassModificationProhibited	m		m		m			
c11: If [Signed-Ops] then support of this feature is m else –.									

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

Prerequisite: [Comm-Arg]

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	serviceControls	m		m		m		* Serv-Ctrls	d({}), See A.6.3.3.15
2	securityParameters	c11		c11		c11		*Sec-Param	See A.6.3.3.27
3	requestor	o		o		o			Note 1
4	operationProgress	m		m		m			d(nameResolutio nPhaseNotStarted)
4.1	nameResolutionPhase	m		m		m			
4.1.1	notStarted	m		m		m			
4.1.2	proceeding	m		m		m			
4.1.3	completed	m		m		m			
4.2	nextRDNTToBeResolved	m		m		m			
5	aliasedRDNs	o		o		o			Note 2
6	criticalExtensions	m		m		m			
7	referenceType	o		o		o			
8	entryOnly	m		m		m			d(true)
9	exclusions	o		o		o			
10	nameResolveOnMaster	o		o		o			d(false)
c11: 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. 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	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	SecurityParameters	c11		c11		c11		*Sec-Param	See A.6.3.3.27
2	performer	o		o		o			
3	aliasedDereferenced	m		m		m			d(false)
c11: 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-Ctrl]

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	options	m		m		m			d({})
1.1	preferChaining	m		m		m			
1.2	chainingProhibited	m		m		m			
1.3	localScope	m		m		m			
1.4	dontUseCopy	m		m		m			
1.5	dontDereferenceAliases	m		m		m			
1.6	subentries	c12		c12		c12			
1.7	copyShallDo	c13		c13		c13			
2	priority	m		m		m			d(medium)
3	timeLimit	o		o		o			
4	sizeLimit	o		o		o			
5	scopeOfReferral	o		o		o			
6	attributeSizeLimit	c14		c14		c14			
c12: If [Subentries] then support of this feature is m else o. c13: If [copyshalldo] then support of this feature is m else o. c14: 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	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	attributes	m		m		m			d(allUserAttributes)
1.1	allUserAttributes	m		m		m			
1.2	select	m		m		m			
2	infoTypes	m		m		m			d(attributeTypesAndValues)
2.1	attributeTypesOnly	m		m		m			
2.2	attributeTypesAndValues	m		m		m			
3	extraAttributes	o		o		o			
3.1	allOperationalAttributes	c:m		c:m		c:m			
3.2	select	c:m		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	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	name	m		m		m			
2	fromEntry	m		m		m			d(true)
3	Information	m		m		m			
3.1	AttributeType	m		m		m			
3.2	Attribute	m		m		m			
4	incompleteEntry	m		m		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	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	item	m		m		m		*Filt-Item	See A.6.3.3.19
2	and	m		m		m			
3	or	m		m		m			
4	not	m		m		m			

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

Prerequisite: [Filt-Item]

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	equality	m		m		m			
2	substrings	m		m		m			
2.1	type	m		m		m			
2.2	strings	m		m		m			
2.2.1	initial	m		m		m			
2.2.2	any	m		m		m			
2.2.3	final	m		m		m			
3	greaterOrEqual	m		m		m			
4	lessOrEqual	m		m		m			
5	present	m		m		m			
6	approximateMatch	m		m		m			
7	extensibleMatch	c8		c8		c8			
7.1	MatchingRule	c:m		c:m		c:m			
7.2	type	c:m		c:m		c:m			
7.3	matchValue	c:m		c:m		c:m			
7.4	dnAttributes	c:m		c:m		c:m			d(false)
c8: 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)

PagedResults is out of scope for DSP.

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

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	targetObject	m		m		m			
2	aliasedRDNs	o		o		o			
3	operationProgress	m		m		m			
3.1	nameResolutionPhase	m		m		m			
3.2	nextRDNTToBeResolved	m		m		m			
4	rdnsResolved	m		o		m			
5	referenceType	m		m		m			
6	accessPoints	m		m		m			
6.1	MasterOrShadowAccessPoint	m		m		m			
6.1.1	AccessPoint	m		m		m			See A.6.3.3.26
6.1.2	category	m		m		m			d{master}
6.1.2.1	master	m		m		m			
6.1.2.2	shadow	m		m		m			
6.2	additionalPoints	m		o		m			
6.2.1	AccessPoint	m		m		m			See A.6.3.3.26
6.2.2	category	m		m		m			
6.2.2.1	master	m		m		m			
6.2.2.2	shadow	m		m		m			
7	entryOnly	m		m		m			d(false)
8	exclusions	o		o		o			
9	returnToDUA	o		o		o			d(false)
10	nameResolveOnMaster	m		c15		m			d(false)
c15: If [NSSR] then support of this feature is m else –.									

A.6.3.3.22 Chaining Argument Elements (Ref. X.518 | 9594-4, 10.3)

Prerequisite: [Chain-Arg]

Item No.	Argument	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	originator	m		m		m			
2	targetObject	o		m		m			
3	operationProgress	m		m		m			d(nameResolutionPhaseNotStarted)
3.1	nameResolutionPhase	m		m		m			
3.1.1	notStarted	m		m		m			
3.1.2	proceeding	m		m		m			
3.1.3	completed	m		m		m			
3.2	nextRDNTToBeResolved	m		m		m			
4	traceInformation	m		m		m		*Trace-Info	See A.6.3.3.25
5	aliasDereferenced	m		m		m			d(false)
6	aliasedRDNs	o		o		o			
7	returnCrossRefs	o		o		o			d(false)

A.6.3.3.22 Chaining Argument Elements (Ref. X.518 | 9594-4, 10.3) (*continued*)

Prerequisite: [Chain-Arg]

Item No.	Argument	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
8	referenceType	m		m		m			d(superior)
8.1	superior	m		m		m			
8.2	subordinate	m		m		m			
8.3	cross	m		m		m			
8.4	nonSpecificSubordinate	m		m		m			
8.5	supplier	m		m		m			
8.6	master	m		m		m			
8.7	immediateSuperior	m		m		m			
8.8	self	m		m		m			
9	info	o		o		o			
10	timeLimit	m		m		m			
11	securityParameters	c11		c11		c11		*Sec-Param	d({}), See A.6.3.3.27
12	entryOnly	m		m		m			
13	uniqueIdentifier	o		o		o			
14	authenticationLevel	o		o		o			
15	exclusions	o		o		o			
16	excludeShadows	o		m		m			d(false)
17	nameResolveOnMaster	m		c15		m			d(false)
c11: If [Signed-Ops] then support of this feature is m else –.									
c15: If [NSSR] then support of this feature is m else –.									

A.6.3.3.23 Chaining Result Elements(Ref. X.518 | 9594-4, 10.4)

Prerequisite: [Chain-Res]

Item No.	Protocol Elements	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	info	o		o		o			
2	crossReferences	o		o		o		*Cross-Ref	See A.6.3.3.24
3	securityParameters	c11		c11		c11		*Sec-Param	d({}), See A.6.3.3.27
4	alreadysearched	m		m		m			
c11: If [Signed-Ops] then support of this feature is m else –.									

A.6.3.3.24 Cross Reference [Ref. X.518 | 9594-4, 10.4 b)]

Prerequisite: [Cross-Ref]

Item No.	Protocol Elements	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	contextPrefix	m		m		m			
2	accessPoint	m		m		m			
2.1	MasterOrShadowAccessPoint	m		m		m			
2.1.1	AccessPoint	m		m		m			See A.6.3.3.26
2.1.2	category	m		m		m			d(master)
2.1.2.1	master	m		m		m			
2.1.2.2	shadow	m		m		m			
2.2	additionalPoints	o		o		o			

A.6.3.3.25 Trace Information (Ref. X.518 | 9594-4, 10.6)

Prerequisite: [Trace-Info]

Item No.	Protocol Elements	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	TraceItem	m		m		m			
1.1	dsa	m		m		m			
1.2	targetObject	m		m		m			
1.3	operationProgress	m		m		m			
1.3.1	nameResolutionPhase	m		m		m			
1.3.1.1	notStarted	m		m		m			
1.3.1.2	proceeding	m		m		m			
1.3.1.3	completed	m		m		m			
1.3.2	nextRDNTToBeResolved	m		m		m			

A.6.3.3.26 Access Point (Ref. X.518 | 9594-4, 10.8)

Item No.	Protocol Elements	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	ae-title	m		m		m			
2	address	m		m		m			
2.1	pSelector	o		m		m			
2.2	sSelector	o		m		m			
2.3	tSelector	o		m		m			
2.4	nAddresses	m		m		m			
3	protocolInformation	o		o		o			

A.6.3.3.27 SecurityParameters (Ref. X.511 | 9594-3, 7.10)

Prerequisite: [Sec-Param]

Item No.	Protocol Elements	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	certification-path	m		m		m		*Cert-Path	
2	name	m		m		m			
3	time	m		o		m			
4	random	m		o		m			
5	target	m		m		m			

A.6.3.3.28 CertificationPath (Ref. X.509 | 9594-8, 8)

Prerequisite: [Cert-Path]

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	userCertificate	m		m		m			
2	theCACertificates	o		o		o			
2.1	forward	c:o.3		c:o.3		c:o.3			
2.2	reverse	c:o.3		c:o.3		c:o.3			
o.3: 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.6.3.3.28.1 Certificate (Ref. X.509 | 9594-8, 8)

Prerequisite: [Cert-Path]

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	toBeSigned	m		m		m			
1.1	version	m		m		m			d(v1)
1.2	serialNumber	m		m		m			
1.3	signature	m		m		m			See A.6.3. 3.23.2
1.4	issuer	m		m		m			
1.5	validity	m		m		m			
1.5.1	notBefore	m		m		m			
1.5.2	notAfter	m		m		m			
1.6	subject	m		m		m			
1.7	subjectPublicKeyInfo	m		m		m			
1.7.1	algorithm	m		m		m			
1.7.2	subjectPublicKey	m		m		m			
1.8	issuerUniqueIdentifier	o		o		o			Note
1.9	subjectUniqueIdentifier	o		o		o			Note
1.10	extensions	c16		c16		c16		*Extensions	See A.6.3. 3.23.3
2	algorithmIdentifier	m		m		m		*Algor-ID	See A.6.3. 3.23.2
3	encrypted	m		m		m			
c16: If version 3 then support of this feature is m else o.									
NOTE – If present, version must be 2 or 3.									

A.6.3.3.28.2 Algorithm Identifier (Ref. X.509 | 9594-8, 8)

Prerequisite: [Algor-ID]

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	algorithm	m		m		m			
2	parameters	m		m		m			

A.6.3.3.28.3 Extensions (Ref. X.509 | 9594-8, 8)

Prerequisite: [Extensions]

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	extnID	m		m		m			
2	critical	m		m		m			
3	extnValue	m		m		m			

A.6.3.3.29 Access Control (Ref. X.501 | 9594-2, 16)**A.6.3.3.29.1 Access Control Information** (Ref. X.501 | 9594-2, 16.4)

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	ACIItem	c17		c17		c17		*ACI	
1.1	identificationTag	c:m		c:m		c:m			
1.2	precedence	c:m		c:m		c:m			
1.3	authenticationLevel	c:m		c:m		c:m			
1.3.1	basicLevels	c:m		c:m		c:m			
1.3.1.1	level	c:m		c:m		c:m			
1.3.1.2	localQualifier	c:o		c:o		c:o			
1.3.2	other	i		i		i			
1.4	itemOrUserFirst	c:m		c:m		c:m			
1.4.1	itemFirst	c:m		c:m		c:m			
1.4.1.1	protectedItems	c:m		c:m		c:m			See A.6.3.3.29.2
1.4.1.2	itemPermissions	c:m		c:m		c:m			
1.4.1.2.1	precedence	c:o		c:o		c:o			d(A.6.3.3. 29.1/3)
1.4.1.2.2	userClasses	c:o		c:o		c:o		*User-Class	See A.6.3.3.29.3
1.4.1.2.3	grantsAndDenials	c:m		c:m		c:m			See A.6.3.3.29.4
1.4.2	userFirst	c:m		c:m		c:m			
1.4.2.1	userClasses	c:o		c:o		c:o		*User-Class	See A.6.3.3.29.3
1.4.2.2	userPermissions	c:m		c:m		c:m			
1.4.2.2.1	precedence	c:o		c:o		c:o			d(A.6.3.3. 29.1/3)
1.4.2.2.2	protectedItems	c:m		c:m		c:m			See A.6.3.3.29.2
1.4.2.2.3	grantsAndDenials	c:m		c:m		c:m			See A.6.3.3.29.4
c17: If [SAC-DSA or BAC-DSA] then support of this feature is m else –.									

A.6.3.3.29.2 Protected Items [Ref. X.501 | 9594-2, 16.4.2.4 a)]

Prerequisite: [ACI]

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

A.6.3.3.29.3 UserClasses [Ref. X.501 | 9594-2, 16.4.2.4 b)]

Prerequisite: [User-Class]

Item No.	Protocol Element	Initiator		Responder		Relay		Predicate	Note
		Status	Support	Status	Support	Status	Support		
1	allUsers	o		o		o			
2	thisEntry	o		o		o			
3	name	o		o		o			
4	userGroup	o		o		o			
5	subtree	o		o		o		*Subtree	

A.6.3.3.29.4 Grants and Denials (Ref. X.501 | 9594-2, 16.4.1)

Prerequisite: [ACI]

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

A.6.3.3.29.5 Subtree Specification (Ref. X.501 | 9594-2, 11.3)

Prerequisite[Subentries or Subtree]

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

A.6.4 Directory schema and Directory System Schema

The implementor or supplier is not required to submit this section if the schema and system schema section of the DAP PICS has or will be completed for the DSA. If a DAP PICS for the DSA will not be submitted, this section must be completed.

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	Status	Support	Note
1	top	m		
2	alias	m		
3	country	o		
4	locality	o		
5	organization	o		
6	organizationalUnit	o		
7	person	o		
8	organizationalPerson	o		
9	organizationalRole	o		
10	groupOfNames	o		
11	groupOfUniqueNames	o		
12	residentialPerson	o		
13	applicationProcess	o		
14	applicationEntity	o		
15	dSA	m		
16	device	o		
17	strongAuthenticationUser	o		
18	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 Directory String Types (Ref. X.520 | 9594-6)

Item No.	Attribute Type	Upperbound	Status	Support	Note
1	DirectoryString		m		
1.1	teletexString		m		
1.2	printableString		m		
1.3	BMPString		o		
1.4	universalString		o		

A.6.4.3 Supported Attribute Types**A.6.4.3.1 Attribute Types**

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	Status	Support	Note
1	objectClass		m		
2	aliasedEntryName		o		
3	knowledgeInformation		o		
4	name	32768	o		
5	commonName	64	c12		
6	surname	64	o		
7	givenName	32768	o		
8	initials	32768	o		
9	generationQualifier	32768	o		
10	uniqueIdentifier		o		
11	dnQualifier		o		
12	serialNumber	64	o		
13	countryName		o		size = 2
14	localityName	128	o		
15	stateOrProvinceName	128	o		
16	streetAddress	128	o		
17	houseIdentifier	64	o		
18	organizationName	64	o		
19	organizationalUnitName	64	o		
20	title	64	o		
21	description	1024	o		
22	searchGuide		o		
23	enhancedSearchGuide		o		
24	businessCategory	128	o		
25	postalAddress	6(lines) × 30(chs)	o		
26	postalCode	40	o		
27	postOfficeBox	40	o		
28	physicalDeliveryOfficeName	128	o		
29	telephoneNumber	32	o		

A.6.4.3.1 Attribute Types (*continued*)

Item No.	Attribute Type	Upperbound	Status	Support	Note
30	telexNumber	14, 4, 8	o		
31	teletexTerminalIdentifier	1024	o		
32	facsimileTelephoneNumber	32	o		
33	X.121 Address	15	o		
34	internationalISDNNumber	16	o		
35	registeredAddress	6(lines) × 30(chs)	o		
36	destinationIndicator	128	o		
37	preferredDeliveryMethod		o		
38	presentationAddress		o		
39	supportedApplicationContext		o		
40	protocolInformation		o		
41	distinguishedName		o		
42	member		o		
43	uniqueMember		o		
44	owner		o		
45	roleOccupant		o		
46	seeAlso		o		
47	userPassword	128	c18		
48	userCertificate		c4		
49	cACertificate		c4		
50	authorityRevocationList		o		
51	certificateRevocationList		o		
52	crossCertificatePair		o		
c4: If [Strong-DSA] then support is m else support is o. c12: If [Subentries] then this attribute is m else o. c18: If [Password] then this attribute 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:

If the supplied implementation supports the collective attributes claimed in A.6.2.1/9, then A.6.4.3 is required to be answered by the supplier.

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

A.6.4.4 Matching Rules (Ref. X.521 | 9594-7)

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	Status	Support	Note
1	caseIgnoreMatch	o		
2	caseIgnoreOrderingMatch	o		
3	caseIgnoreSubstringMatch	o		
4	caseExactMatch	o		
5	caseExactOrderingMatch	o		
6	caseExactSubstringsMatch	o		
7	numericStringMatch	o		
8	numericStringOrderingMatch	o		
9	numericStringSubstringsMatch	o		
10	caseIgnoreListMatch	o		
11	caseIgnoreListSubstringsMatch	o		
12	booleanMatch	o		
13	integerMatch	o		
14	integerOrderingMatch	o		
15	bitStringMatch	o		
16	octetStringMatch	o		
17	octetStringOrderingMatch	o		
18	octetStringSubStringsMatch	o		
19	telephoneNumberMatch	o		
20	telephoneNumberSubstringsMatch	o		
21	presentationAddressMatch	o		
22	uniqueMemberMatch	o		
23	protocolInformationMatch	o		
24	uTCTimeMatch	o		
25	uTCTimeOrderingMatch	o		
26	generalizedTimeMatch	o		
27	generalizedTimeOrderingMatch	o		
28	integerFirstComponentMatch	o		
29	objectIdentifierFirstComponentMatch	o		
30	directoryStringFirstComponentMatch	o		
31	wordMatch	o		
32	keywordMatch	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	Status	Support	Note
1	countryNameForm	o		
2	locNameForm	o		
3	sOPNameForm	o		
4	orgNameForm	o		
5	orgUnitNameForm	o		
6	personNameForm	o		
7	orgPersonNameForm	o		
8	orgRoleNameForm	o		
9	gONNameForm	o		
10	resPersonNameForm	o		
11	applProcessNameForm	o		
12	applEntityNameForm	o		
13	dSANNameForm	o		
14	deviceNameForm	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, matching rules, and name forms 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	Status	Support	Predicate	Note
1	subentry	m			
2	accessControlSubentry	c17			
3	collectiveAttributeSubentry	c19			
c17: If [SAC-DSA or BAC-DSA]] then support of this feature is m else –.					
c19: If [Coll-Attr] then support of this feature is m else –.					

A.6.4.6.2 Information Framework Attributes

Item No.	Attribute	Status	Support	Predicate	Note
1	createTimestamp	o			
2	modifyTimestamp	o			
3	creatorsName	o			
4	modifiersName	o			
5	administrativeRole	m			
6	subtreeSpecification	c12			
7	collectiveExclusions	o			
c12: If [Subentries] then support of this feature is m else o.					

A.6.4.6.3 Information Framework Matching Rules

Item No.	Matching rule	Status	Support	Predicate	Note
1	objectIdentifierMatch	m			
2	distinguishedNameMatch	m			

A.6.4.6.4 Information Framework Name Forms

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

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

If the supplied implementation supports the subschema for its portion of the DSA claimed in item A.6.2.1/12, 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	Status	Support	Predicate	Note
1	subschema	c20			
c20: If [SubSchema] then support of this feature is m else o.					

A.6.4.7.2 Subschema Administration Attributes

Item No.	Attribute	Status	Support	Predicate	Note
1	dITStructureRules	c20			
2	dITContentRules	c20			
3	matchingRules	c20			
4	attributeTypes	c20			
5	objectClasses	c20			
6	nameForms	c20			
7	matchingRuleUse	o			
8	structuralObjectClass	c20			
9	governingStructureRule	c20			
c20: 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-DSA or BAC-DSA]

Item No.	Attribute	Status	Support	Predicate	Note
1	accessControlScheme	c17			
2	prescriptiveACI	m			
3	entryACI	c21			
4	subentryACI	m			
c17: If [SAC-DSA or BAC-DSA] then support of this feature is m else –.					
c21: If [BAC-DSA] then support of this feature is m else o.					

A.6.4.8.3 Access Control Matching Rules

None.

A.6.4.9 DSA Operational Attributes (Ref. X.501 | 9594-2, 20)**A.6.4.9.1 DSA Operational Attribute Object Classes**

None.

A.6.4.9.2 DSA Operational Attribute Types

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

A.6.4.9.3 DSA Operational Matching Rules

Item No.	Matching Rule	Status	Support	Predicate	Note
1	accessPointMatch	m			
2	masterAndShadowAccessPointsMatch	o			
3	supplierOrConsumerInformationMatch	o			
4	supplierAndConsumerMatch	–			

A.6.5 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