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SECTEUR DE LA NORMALISATION
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DE L'UIT

X.584

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SÉRIE X: RÉSEAUX POUR DONNÉES ET
COMMUNICATION ENTRE SYSTÈMES OUVERTS

Annuaire

**Technologies de l'information – Interconnexion
des systèmes ouverts – L'annuaire:
formulaire de déclaration de conformité
d'une implémentation du protocole de
système d'annuaire**

Recommandation UIT-T X.584

(Antérieurement Recommandation du CCITT)

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NORME INTERNATIONALE 13248-2

RECOMMANDATION UIT-T X.584

**TECHNOLOGIES DE L'INFORMATION – INTERCONNEXION DES SYSTÈMES
OUVERTS – L'ANNUAIRE: FORMULAIRE DE DÉCLARATION DE CONFORMITÉ
D'UNE IMPLÉMENTATION DU PROTOCOLE DE SYSTÈME D'ANNUAIRE**

Résumé

La présente Recommandation | Norme internationale contient le formulaire de déclaration de conformité d'une implémentation de protocole (PICS) pour le protocole de système d'annuaire (DSP, *directory system protocol*), spécifié dans les Recommandations UIT-T de la série X.500 (1993) | ISO/CEI 9594:1995.

La présente Recommandation | Norme internationale a pour objet la spécification des déclarations de conformité pour un agent de système d'annuaire (DSA, *directory system agent*).

Source

La Recommandation X.584 de l'UIT-T a été approuvée le 12 décembre 1997. Un texte identique est publié comme Norme internationale ISO/CEI 13248-2.

AVANT-PROPOS

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La Conférence mondiale de normalisation des télécommunications (CMNT), qui se réunit tous les quatre ans, détermine les thèmes d'études à traiter par les Commissions d'études de l'UIT-T, lesquelles élaborent en retour des Recommandations sur ces thèmes.

L'approbation des Recommandations par les Membres de l'UIT-T s'effectue selon la procédure définie dans la Résolution n° 1 de la CMNT.

Dans certains secteurs des technologies de l'information qui correspondent à la sphère de compétence de l'UIT-T, les normes nécessaires se préparent en collaboration avec l'ISO et la CEI.

NOTE

Dans la présente Recommandation, l'expression "Administration" est utilisée pour désigner de façon abrégée aussi bien une administration de télécommunications qu'une exploitation reconnue.

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A la date d'approbation de la présente Recommandation, l'UIT n'avait pas été avisée de l'existence d'une propriété intellectuelle protégée par des brevets à acquérir pour mettre en œuvre la présente Recommandation. Toutefois, comme il ne s'agit peut-être pas de renseignements les plus récents, il est vivement recommandé aux responsables de la mise en œuvre de consulter la base de données des brevets du TSB.

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Introduction

La présente Recommandation | Norme internationale a été élaborée en vue de faciliter l'interconnexion des équipements informatiques et permettre ainsi d'assurer des services d'annuaire. L'ensemble de ces équipements, avec les informations d'annuaire qu'ils contiennent, peut être considéré comme un tout intégré, appelé **l'annuaire**. Les informations contenues dans l'annuaire, appelées collectivement "base de données de l'annuaire" (DIB, *directory information base*), sont généralement utilisées pour faciliter la communication entre des objets tels que entités d'application, individus, terminaux, listes de distribution, ainsi que les communications avec ces objets ou au sujet de ces objets.

L'annuaire joue un rôle important dans l'interconnexion des systèmes ouverts, dont le but est de permettre, moyennant un minimum d'accords techniques en dehors des normes d'interconnexion, l'interconnexion d'équipements informatiques:

- provenant de divers fabricants;
- gérés différemment;
- de niveaux de complexité différents;
- de générations différentes.

Pour évaluer la conformité d'une implémentation particulière, il est nécessaire de disposer d'une déclaration des capacités et des options qui ont été incluses pour un protocole OSI donné. Une telle déclaration est appelée déclaration de conformité d'une implémentation de protocole (PICS).

La présente Recommandation | Norme internationale contient le formulaire de déclaration de conformité d'une implémentation de protocole (PICS) pour le protocole de système d'annuaire (DSP, *directory system protocol*) spécifié dans les Recommandations UIT-T de la série X.500 (1993) | ISO/CEI 9594:1995. Toutes les références concernant les spécifications d'Annuaire paraissant dans la présente Recommandation | Norme internationale se rapportent à la deuxième version de ces spécifications (Recommandations UIT-T de la série X.500 (1993) | ISO/CEI 9594:1995).

L'Annexe A contient la spécification du formulaire PICS pour le protocole de système d'annuaire, tel qu'il est défini dans les Recommandations UIT-T de la série X.500 | ISO/CEI 9594.

TECHNOLOGIES DE L'INFORMATION – INTERCONNEXION DES SYSTÈMES OUVERTS – L'ANNUAIRE: FORMULAIRE DE DÉCLARATION DE CONFORMITÉ D'UNE IMPLÉMENTATION DU PROTOCOLE DE SYSTÈME D'ANNUAIRE

1 Domaine d'application

La présente Recommandation | Norme internationale contient le formulaire PICS pour le protocole de système d'annuaire (DSP), spécifié dans les Recommandations UIT-T de la série X.500 (1993) | ISO/CEI 9594:1995. Ce formulaire est conforme aux prescriptions applicables et respecte les directives relatives aux formulaires PICS, données dans la Rec. UIT-T X.296 | ISO/CEI 9646-7.

Le fournisseur d'une implémentation de protocole DSP qu'il déclare conforme aux spécifications des Recommandations UIT-T de la série X.500 | ISO/CEI 9594 doit remplir un exemplaire du formulaire PICS reproduit à l'Annexe A et fournir les renseignements nécessaires pour permettre d'identifier le fournisseur et l'implémentation.

La présente Recommandation | Norme internationale a pour objet la spécification des déclarations de conformité pour un agent de système d'annuaire (DSA).

2 Références normatives

Les Recommandations et les Normes internationales suivantes contiennent des dispositions qui, par suite de la référence qui y est faite, constituent des dispositions valables pour la présente Recommandation | Norme internationale. Les membres de la CEI et de l'ISO possèdent le registre des Normes internationales en vigueur. Le Bureau de la normalisation des télécommunications de l'UIT tient à jour une liste des Recommandations de l'UIT-T en vigueur.

2.1 Recommandations | Normes internationales identiques

- Recommandation UIT-T X.500 (1993) | ISO/CEI 9594-1:1995, *Technologies de l'information – Interconnexion des systèmes ouverts – L'annuaire: vue d'ensemble des concepts, modèles et services.*
- Recommandation UIT-T X.501 (1993) | ISO/CEI 9594-2:1995, *Technologies de l'information – Interconnexion des systèmes ouverts – L'annuaire: les modèles.*
- Recommandation UIT-T X.509 (1993) | ISO/CEI 9594-8:1995, *Technologies de l'information – Interconnexion des systèmes ouverts – L'annuaire: cadre d'authentification.*
- Recommandation UIT-T X.511 (1993) | ISO/CEI 9594-3:1995, *Technologies de l'information – Interconnexion des systèmes ouverts – L'annuaire: définition du service abstrait.*
- Recommandation UIT-T X.518 (1993) | ISO/CEI 9594-4:1995, *Technologies de l'information – Interconnexion des systèmes ouverts – L'annuaire: procédures pour le fonctionnement réparti.*
- Recommandation UIT-T X.519 (1993) | ISO/CEI 9594-5:1995, *Technologies de l'information – Interconnexion des systèmes ouverts – L'annuaire: spécification du protocole.*
- Recommandation UIT-T X.520 (1993) | ISO/CEI 9594-6:1995, *Technologies de l'information – Interconnexion des systèmes ouverts – L'annuaire: types d'attributs sélectionnés.*
- Recommandation UIT-T X.521 (1993) | ISO/CEI 9594-7:1995, *Technologies de l'information – Interconnexion des systèmes ouverts – L'annuaire: classes d'objets sélectionnées.*
- Recommandation UIT-T X.525 (1993) | ISO/CEI 9594-9:1995, *Technologies de l'information – Interconnexion des systèmes ouverts – L'annuaire: duplication.*

2.2 Paires de Recommandations | Normes internationales équivalentes par leur contenu technique

- Recommandation UIT-T X.290 (1995), *Cadre général et méthodologie des tests de conformité d'interconnexion des systèmes ouverts pour les Recommandations sur les protocoles pour les applications de l'UIT-T – Concepts généraux.*

ISO/CEI 9646-1:1994, *Technologies de l'information – Interconnexion de systèmes ouverts – Cadre général et méthodologie des tests de conformité OSI – Partie 1: Concepts généraux.*

- Recommandation UIT-T X.296 (1995), *Cadre général et méthodologie des tests de conformité OSI pour les Recommandations sur les protocoles pour les applications de l'UIT-T – Déclarations de conformité d'instance.*

ISO/CEI 9646-7:1995, *Technologies de l'information – Interconnexion de systèmes ouverts (OSI) – Essais de conformité – Méthodologie générale et procédures – Partie 7: Déclarations de conformité des mises en œuvre.*

3 Définitions

Pour les besoins de la présente Recommandation | Norme internationale, les définitions suivantes s'appliquent.

3.1 Définitions relatives à l'annuaire

La présente Recommandation | Norme internationale utilise les termes définis dans les Recommandations UIT-T de la série X.500 | ISO/CEI 9594.

3.2 Définitions relatives à la conformité

La présente Recommandation | Norme internationale utilise les termes suivants, définis dans la Rec. UIT-T X.290 | ISO/CEI 9646-1:

- a) déclaration de conformité d'une implémentation de protocole (PICS);
- b) formulaire PICS;
- c) conformité;
- d) prescription obligatoire;
- e) prescription optionnelle;
- f) prescription conditionnelle.

3.3 Définitions de base pour la conformité relative à l'annuaire

Pour les besoins de la présente Recommandation | Norme internationale, les définitions suivantes s'appliquent.

3.3.1 agent DSA centralisé: agent de système d'annuaire (DSA) qui n'est pas capable de disposer d'informations sur d'autres agents DSA. Un tel agent DSA n'est pas capable de retourner des éléments en référence.

3.3.2 agent DSA coopérant: agent DSA capable de détenir des informations sur les références. Un tel agent DSA est capable de retourner des éléments en référence et peut aussi être un agent DSA de chaînage.

3.3.3 agent DSA de chaînage: agent DSA coopérant capable d'invoquer des opérations chaînées, fonctionnant comme un invocateur de protocole DSP. Un agent DSA de chaînage est aussi un agent DSA coopérant.

3.3.4 agent DSA initiateur: premier agent d'un certain nombre d'agents DSA à coopérer pour faire progresser une requête d'utilisateur. Voir les Figures 1 et 2.

3.3.5 agent DSA relais: agent DSA qui déclenche une opération en chaîne, ceci étant le résultat d'un relais dans la phase de résolution de nom. Voir la Figure 2.

3.3.6 agent DSA répondeur: agent DSA qui traite une requête et génère un résultat ou une erreur. Voir les Figures 1 et 2.

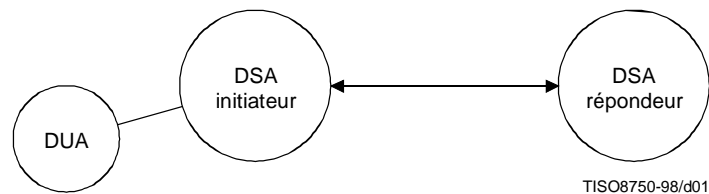


Figure 1

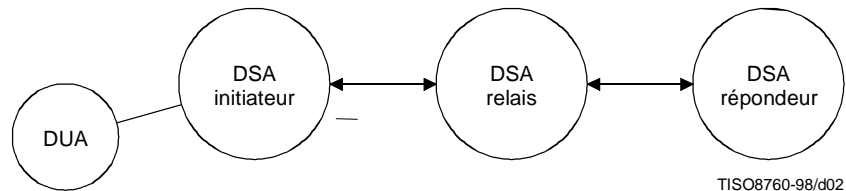


Figure 2

3.3.7 niveau de sécurité: des niveaux de sécurité seront déclarés pour l'authentification de l'entité homologue, pour l'authentification de l'expéditeur et pour l'authentification des résultats.

- Pour l'authentification de l'expéditeur, il existe cinq niveaux de sécurité: "aucune", "simple sans mot de passe", "simple avec mot de passe non protégé", "simple avec mot de passe protégé" et "forte".
- Pour l'authentification de l'entité homologue, il existe trois niveaux de sécurité: "aucune", "simple avec nom distinctif" et "forte".
- Pour l'authentification des résultats, il existe deux niveaux de sécurité: "aucune" et "forte".

4 Abréviations

Pour les besoins de la présente déclaration de conformité d'implémentation de protocole, les abréviations suivantes s'appliquent.

ACI	Information de contrôle d'accès (<i>access control information</i>)
CCITT	Comité consultatif international télégraphique et téléphonique
CEI	Commission électrotechnique internationale
DAP	Protocole d'accès à l'annuaire (<i>directory access protocol</i>)
DIB	Base de données de l'annuaire (<i>directory information base</i>)
DISP	Protocole de duplication miroir des informations d'annuaire (<i>directory information shadowing protocol</i>)
DIT	Arbre d'informations de l'annuaire (<i>directory information tree</i>)
DOP	Protocole de gestion de liens opérationnels de l'annuaire (<i>directory operational binding management protocol</i>)
DSA	Agent de système d'annuaire (<i>directory system agent</i>)
DSP	Protocole de système d'annuaire (<i>directory system protocol</i>)
DUA	Agent d'utilisateur d'annuaire (<i>directory user agent</i>)
ISO	Organisation internationale de normalisation (<i>international organization for standardization</i>)
IUT	Implémentation sous test (<i>implementation under test</i>)
NSAP	Point d'accès aux services de couche Réseau (<i>network service access point</i>)
NSSR	Référence subordonnée non spécifique (<i>non-specific subordinate reference</i>)

PDU	Unité de données protocolaires (<i>protocol data unit</i>)
PICS	Déclaration de conformité d'une implémentation de protocole (<i>protocol implementation conformance statement</i>)
RDN	Nom distinctif relatif (<i>relative distinguished name</i>)
ROSE	Elément de service d'opérations distantes (<i>remote operations service element</i>)
UIT	Union internationale des télécommunications
UIT-T	Union internationale des télécommunications – Secteur de la normalisation des télécommunications

5 Conventions

La présente Recommandation | Norme internationale se rapporte exclusivement à la deuxième édition des spécifications relatives à l'annuaire énumérées à l'article 2.

6 Conformité

Un formulaire PICS conforme doit être techniquement équivalent au formulaire PICS publié par les Recommandations UIT-T de la série X.500 (1993) | ISO/CEI 9594:1995 et doit en conserver la numérotation et l'ordre des articles.

Un formulaire PICS qui obéit aux dispositions de la présente Recommandation | Norme internationale doit:

- a) décrire une implémentation qui obéit aux dispositions des Recommandations UIT-T de la série X.500 | ISO/CEI 9594;
- b) être un formulaire PICS conforme, qui a été rempli selon les règles données en A.2;
- c) contenir les renseignements nécessaires pour permettre d'identifier de façon univoque le fournisseur et l'implémentation.

Annexe A¹⁾

**Protocole de système d'annuaire –
Formulaire de déclaration de conformité d'une implémentation de protocole**

(Cette annexe fait partie intégrante de la présente Recommandation | Norme internationale)

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⁾ **Droits de reproduction du formulaire ICS**

Les utilisateurs de la présente Recommandation | Norme internationale sont autorisés à reproduire le formulaire ICS de la présente annexe pour utiliser celui-ci conformément à son objet.

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:

- notxx 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	ModifyDNArgument	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	CommonArguments	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	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	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	DSAReferral	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(nameResolutionPhaseNotStarted)
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)
<p>c11: If [Signed-Ops] then support of this feature is m else –.</p> <p>NOTE 1 – This parameter may be ignored unless the request is signed.</p> <p>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.</p>									

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)
<p>c11: If [Signed-Ops] then support of this feature is m else –.</p>									

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

Prerequisite: [Serv-Ctrls]

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 [attrszelimit] 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(attributeTypes AndValues)
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	nextRDNToBeResolved	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			

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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			
<p>NOTE 1 – At least Null set is supported.</p> <p>NOTE 2 – At least a minimum of 0 is supported.</p>									

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		
<p>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.</p>					

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		

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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.					

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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

SÉRIES DES RECOMMANDATIONS UIT-T

Série A	Organisation du travail de l'UIT-T
Série B	Moyens d'expression: définitions, symboles, classification
Série C	Statistiques générales des télécommunications
Série D	Principes généraux de tarification
Série E	Exploitation générale du réseau, service téléphonique, exploitation des services et facteurs humains
Série F	Services de télécommunication non téléphoniques
Série G	Systèmes et supports de transmission, systèmes et réseaux numériques
Série H	Systèmes audiovisuels et multimédias
Série I	Réseau numérique à intégration de services
Série J	Transmission des signaux radiophoniques, télévisuels et autres signaux multimédias
Série K	Protection contre les perturbations
Série L	Construction, installation et protection des câbles et autres éléments des installations extérieures
Série M	RGT et maintenance des réseaux: systèmes de transmission, de télégraphie, de télécopie, circuits téléphoniques et circuits loués internationaux
Série N	Maintenance: circuits internationaux de transmission radiophonique et télévisuelle
Série O	Spécifications des appareils de mesure
Série P	Qualité de transmission téléphonique, installations téléphoniques et réseaux locaux
Série Q	Commutation et signalisation
Série R	Transmission télégraphique
Série S	Equipements terminaux de télégraphie
Série T	Terminaux des services télématiques
Série U	Commutation télégraphique
Série V	Communications de données sur le réseau téléphonique
Série X	Réseaux pour données et communication entre systèmes ouverts
Série Y	Infrastructure mondiale de l'information
Série Z	Langages de programmation