INTERNATIONAL STANDARDIZED PROFILE

ISO/IEC ISP 15126-1

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Information technology — International Standardized Profiles FDY1n — Directory data definitions —

Part 1:
FDY11 — Common directory use (normal)

Technologies de l'information — Profils normalisés internationaux FDY1n — Définitions de données de l'Annuaire —

Partie 1: FDY11 — Emploi courant (normal) de l'Annuaire

Reference number
ISO/IEC ISP 15126-1:1999(E)

Contents

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. In addition to developing International Standards, ISO/IEC JTC 1 has created a Special Group on Functional Standardization for the elaboration of International Standardized Profiles.

An International Standardized Profile is an internationally agreed, harmonized document which identifies a standard or group of standards, together with options and parameters, necessary to accomplish a function or a set of functions.

Draft International Standardized Profiles are circulated to national bodies for voting. Publication as an International Standardized Profile requires approval by at least 75 % of the national bodies casting a vote.

International Standardized Profile ISO/IEC ISP 15126-1 was prepared with the collaboration of

— Asia-Oceania Workshop (AOW);

— European Workshop for Open Systems (EWOS);

— Open Systems Environment Implementors' Workshop (OIW).

ISO/IEC ISP 15126 consists of the following parts, under the general title *Information technology — International Standardized Profiles FDY1n — Directory data definitions*:

— *Part 1: FDY11 — Common directory use (normal)*

— *Part 2: FDY12 — Directory system schema*

Annexes A to E form a normative part of this part of ISO/IEC ISP 15126. Annexes F to I are for information only.

Introduction

The concept and structure of International Standardized Profiles for Information Systems are laid down in the Technical Report ISO/IEC TR 10000. The purpose of an International Standardized Profile is to recommend when and how certain information technology standards shall be used. This International Standardized Profile ISO/IEC ISP 15126-1 specifies application profile FDY11 as defined in the Technical Report ISO/IEC TR 10000-2.

ISO/IEC ISP 15126-1 is one of a set of International Standardized Profiles relating to the Directory (see TR 10000-2) for the '93 standards.

ISO/IEC ISP 15126-1 covers information to be stored within the Directory that is common to a variety of applications. Information which is specific to certain applications may be specified by other Profiles.

Directory information may be classified as either:

— user information, placed in the Directory by, or on behalf of, users or

— administrative and operational information, held and managed by the Directory to meet various administrative and operational requirements.

This part of ISO/IEC ISP 15126 is only concerned with the user information; administrative and operational information is profiled by ISO/IEC ISP 15126-2: Directory system schema.

This part of ISO/IEC ISP 15126 specifies requirements that are applicable to implementations of DUAs and DSAs. Additionally, these requirements may guide Directory users and administrative authorities in defining their needs for the use of the Directory.

The primary aim of this profile is to define the minimum capabilities that a DUA and a DSA shall have to support for allowing a basic common view of the Directory information. It does this by specifying a minimum set of object classes, attribute types, name forms, structure rules and matching rules to be supported.

This part of ISO/IEC ISP 15126 does not limit DSAs to these minimum capabilities - a DSA that complies with this part of ISO/IEC ISP 15126 and has no additional information handling (storage, retrieval and modification) capabilities may not be adequate for many purposes, and implementors are strongly encouraged to provide such additional capabilities.

Likewise, this part of ISO/IEC ISP 15126 does not limit Naming Authorities in any way, e.g., restrict their selection of object classes or naming attributes to those which are required to be supported by this Profile. Rather, it guarantees that selections made within the scope of this part ISO/IEC ISP 15126 will be within the capabilities of DSAs compliant with this profile.

This part of ISO/IEC ISP 15126 is harmonized among these three Workshops and it was finally ratified by the Workshops' plenary assemblies.

Information technology — International Standardized Profiles FDY1n — Directory data definitions —

Part 1:
FDY11 — Common directory use (normal)

1 Scope

1.1 General

This part of ISO/IEC ISP 15126 profiles information to be stored within the Directory which is common to a variety of applications. Information which is specific to certain applications may be profiled by other International Standardized Profiles.

The Directory has been designed to support multiple applications, drawn from a wide range of possibilities. The nature of the totality of applications supported will govern which objects are stored in the Directory. Applications may be very specific, such as the provision of distribution lists for electronic mail, or generic, such as an 'inter-personal communications directory' application. The Directory provides the opportunity to exploit commonalities among applications.

To support the implementation of the Directory as defined by the second edition of the IUT-T Rec. X.500-series (1993) | ISO/IEC 9594 (1995), this part of ISO/IEC ISP 15126 gives requirements that are applicable to implementations of Directory System Agents (DSAs) and Directory User Agents (DUAs). Additionally, these requirements may guide Directory users and administrative authorities in use of the Directory.

The primary objective of this part of ISO/IEC ISP 15126 is to define the minimum capabilities that DUAs and DSAs shall support. It does this by specifying a minimum set of requirements concerning the tree structure and the content of the entries for a conformant DSA.

This part of ISO/IEC ISP 15126 does not limit DSAs to these minimum capabilities - a DSA that complies with this part of ISO/IEC ISP 15126 and has no additional information handling (storage, retrieval and modification) capabilities may not be adequate for many purposes, and implementors are strongly encouraged to provide such additional capabilities.

Likewise, this part of ISO/IEC ISP 15126 does not limit Naming Authorities in any way, e.g., restrict their selection of object classes or naming attributes to those which are required to be supported by this part of ISO/IEC ISP 15126. Rather, it guarantees that selections made within the scope of this part of ISO/IEC ISP 15126 will be within the capabilities of DSAs compliant with this International Standardized Profile.

In addition, interworking between DSAs which comply with this part of ISO/IEC ISP 15126 will be greatly facilitated on this minimum basis.

Clause 6 specifies Name forms and DIT Structure rules which may be used to constrain entries belonging to a particular subtree. This is done by reference to and within the scope of ITU-T Rec. X.520 | ISO/IEC 9594-6 and ITU-T Rec. X.521 | ISO/IEC 9594-7. Subclause 7.1 deals with object classes which are common to multiple applications. Subclauses 7.2, 7.3, 7.4 and 7.5 deal with attribute types, DIT content rules, syntax checking and matching rules respectively.

The Directory Access Protocol (DAP) and the Directory System Protocol (DSP), as defined by ITU-T Rec. X.500 series | ISO/IEC 9594, can be used to access information stored in a Directory Information Base (DIB) fragment which is profiled by this part of ISO/IEC ISP 15126.

1.2 Position within the taxonomy

This part of ISO/IEC ISP 15126 is identified in ISO/IEC TR 10000-2 as ”FDY11 - Directory data definitions - Common directory use (normal)”.

1.3 Scenario

A Directory user (e.g., an application-process), by means of its associated Directory User Agent DUA), obtains Directory information by accessing directly or indirectly one or more DSAs of the Directory (see figure 1).

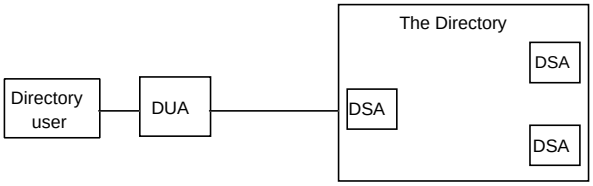

Figure 1 — Access to the Directory

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC ISP 15126. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this part of ISO/IEC ISP 15126 are warned against automatically applying any more recent editions of the documents listed below, since the nature of references made by ISPs to such documents is that they may be specific to a particular edition. Members of IEC and ISO maintain registers of currently valid International Standards and ISPs, and ITU-T maintains published editions of its current Recommendations.

Amendments and corrigenda to the base standards are referenced: see Annex B for a complete list of these documents which are used in this part of ISO/IEC ISP 15126.

2.1 Paired ITU-T Recommendations | International Standards equivalent in technical content

ITU-T Rec. X.500 (1993) | ISO/IEC 9594-1:1995, *Information technology — Open Systems Interconnection — The Directory: Overview of concepts, models, and services.*

ITU-T Rec. X.501 (1993) | ISO/IEC 9594-2:1995, *Information technology — Open Systems Interconnection — The Directory: Models.*

ITU-T Rec. X.511 (1993) | ISO/IEC 9594-3:1995, *Information technology — Open Systems Interconnection — The Directory: Abstract service definition.*

ITU-T Rec. X.518 (1993) | ISO/IEC 9594-4:1995, *Information technology — Open Systems Interconnection — The Directory: Procedures for distributed operation.*

ITU-T Rec. X.519 (1993) | ISO/IEC 9594-5:1995, *Information technology — Open Systems Interconnection — The Directory: Protocol specifications.*

ITU-T Rec. X.520 (1993) | ISO/IEC 9594-6:1995, *Information technology — Open Systems Interconnection — The Directory: Selected attribute types.*

ITU-T Rec. X.521 (1993) | ISO/IEC 9594-7:1995, *Information technology — Open Systems Interconnection — The Directory: Selected object classes.*

ITU-T Rec. X.509 (1993) | ISO/IEC 9594-8:1995, *Information technology — Open Systems Interconnection — The Directory: Authentication framework.*

ITU-T Rec. X.525 (1993) | ISO/IEC 9594-9:1995, *Information technology — Open Systems Interconnection — The Directory: Replication.*

ITU-T Rec. X.680 (1994) | ISO/IEC 8824-1:1995, *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation.*

ITU-T Rec. X.681 (1994) | ISO/IEC 8824-2:1995, *Information technology — Abstract Syntax Notation One (ASN.1): Information object specification.*

ITU-T Rec. X.682 (1994) | ISO/IEC 8824-3:1995, *Information technology — Abstract Syntax Notation One (ASN.1): Constraint specification.*

ITU-T Rec. X.683 (1994) | ISO/IEC 8824-4:1995, *Information technology — Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications.*

ITU-T Rec. X.690 (1994) | ISO/IEC 8825-1:1995, *Information technology — ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER).*

ITU-T Rec. X.880 (1994) | ISO/IEC 13712-1:1995, *Information technology — Remote Operations: Concepts, model and notation.*

ITU-T Rec. X.881 (1994) | ISO/IEC 13712-2:1995, *Information technology — Remote Operations: OSI realizations — Remote Operations Service Element (ROSE) service definition.*

ITU-T Rec. X.882 (1994) | ISO/IEC 13712-3:1995, *Information technology — Remote Operations: OSI realizations — Remote Operations Service Element (ROSE) protocol specification.*

2.2 Normative Amendments and Technical Corrigenda

In accordance with TR 10000-1 subclause 6.3.2 c), attention is drawn to normative Amendments and Technical Corrigenda affecting the Directory Standards documents ISO/IEC 9594:1995 and the ITU-T X.500:1993 recommendations.

It should be noted that references made to these standards are almost always invalid if taken as references to the '88 standards.

Annex D defines the references to the agreed amendments and corrigenda. Compliance with these amendments and corrigenda is necessary to achieve the interoperability requirements for this part of ISO/IEC ISP 15126.

The following subset of these have been identified as particularly relevant to this part of ISO/IEC ISP 15126:

Technical Corrigendum 1 to Recommendation X.501 (1993) | ISO/IEC 9594-2:1995 (addressing DRs 9594/088, 089, 090, 091, 102, 125)

Technical Corrigendum 2 to Recommendation X.501 (1993) | ISO/IEC 9594-2:1995 (addressing DRs 9594/134, 136)

Technical Corrigendum 1 to Recommendation X.511 (1993) | ISO/IEC 9594-3:1995 (addressing DR 9594/085)

Technical Corrigendum 2 to Recommendation X.511 (1993) | ISO/IEC 9594-3:1995 (addressing Defect Reports 9594/119, 133)

Technical Corrigendum 1 to Recommendation X.518 (1993) | ISO/IEC 9594-4:1995 (addressing DRs 9594/094, 106, 108, 109, 111, 112, 113, 114, 115)

Technical Corrigendum 2 to Recommendation X.518 (1993) | ISO/IEC 9594-4:1995 (addressing DRs 9594/116, 117, 118, 119, 120, 121, 130)

Technical Corrigendum 1 to Recommendation X.519 (1993) | ISO/IEC 9594-5:1995 (addressing DRs 9594/075, 124)

Technical Corrigendum 1 to Recommendation X.520 (1993) | ISO/IEC 9594-6:1995 (addressing DRs 9594/076, 122, 127)

Technical Corrigendum 1 to Recommendation X.509 (1993) | ISO/IEC 9594-8:1995 (addressing DR 9594/128)

Technical Corrigendum 2 to Recommendation X.509 (1993) | ISO/IEC 9594-8:1995 (addressing DRs 9594/077, 078, 083, 084)

Technical Corrigendum 3 to Recommendation X.509 (1993) | ISO/IEC 9594-8:1995 (addressing DRs 9594/080, 092, 100)

Technical Corrigendum 1 to Recommendation X.525 (1993) | ISO/IEC 9594-9:1995 (addressing DRs 9594/097, 099, 123)

Technical Corrigendum 2 to Recommendation X.525 (1993) | ISO/IEC 9594-9:1995 (addressing DR 9594/132)

2.3 Additional normative references

ISO/IEC TR 10000-1:1998, *Information technology — Framework and taxonomy of International Standardized Profiles — Part 1: General principles and documentation framework.*

ISO/IEC TR 10000-2:1998, *Information technology — Framework and taxonomy of International Standardized Profiles — Part 2: Principles and Taxonomy for OSI Profiles.*

ISO/IEC ISP 10616:1995, *Information technology — International Standardized Profile FDI11 — Directory data definitions — Common Directory Use (Normal).*

ISO/IEC 13248-1:1998, *Information technology — Open Systems Interconnection — The Directory: Protocol Implementation Conformance Statement (PICS) proforma for the Directory Access Protocol.*

ISO/IEC 13248-2:1998, *Information technology — Open Systems Interconnection — The Directory: Protocol Implementation Conformance Statement (PICS) proforma for the Directory System Protocol.*

ITU-T Recommendation T.61:1988, *Character Repertoire and Coded Character Sets for the International Teletex Service.*

ISO 2022:1986, *Information processing — ISO 7-bit and 8-bit coded character sets — Code extension techniques.*

ISO 3166:1988, *Codes for the representation of the names of countries.*

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

ENV 1973, *Information technology — Minimum European Subset of ISO/IEC 10646-1.*

3 Definitions

3.1 General

Many of the definitions used may be found in the Standards. Since not all of the definitions are to be found in the Definitions clauses within the standards documents, references are listed in Table 1 below. The column "Part" refers to the part number within ISO/IEC 9594 or its ITU-T equivalent (see also clause 2). The column „Reference“ refers to the clause within this part of ISO/IEC ISP 15126.

Table 1 — Definitions and references

Term	Part	Reference
alias	2	9
alias entry	2	7
attribute	2	8
attribute hierarchy	2	8
atttribute supertype	2	8
attribute syntax	2	12
attribute type	2	8
collective attribute	2	8
DIT content rule	2	12
DIT structure rule	2	12
distributed name resolution	4	3
entry	2	8
entry collection	2	8.8
matching rule	2	8
Name Form	2	12
operational attribute	2	11.2
request	4	3
subentry	2	11.1

3.2 Support Level

To specify the support level of protocol features for this part of ISO/IEC ISP 15126, the following terminology is defined.

3.2.1 Mandatory: "m": Mandatory requirement for support

The support of the feature is mandatory for all implementations claiming compliance with this part of ISO/IEC ISP 15126.

3.2.2 Optional: "o": Optional requirement for support

The support of the feature is left to the implementor of the DSA.

3.2.3 Conditional: "c": Conditional requirement for support

The requirement to support the item depends on a specified condition. The condition and the resulting support requirements are stated separately.

3.2.4 Outside the scope: "i"

Support for the item is outside the scope of this part of ISO/IEC ISP 15126.

3.2.5 not applicable: "-"

The item is not defined in the context where it is mentioned. There is no support requirement. The occurrence of "not applicable" is mainly due to the format of the tables in the ISPICS Requirements List.

4 Abbreviations

Following abbreviations are used as defined in ITU-T Rec. X.500 series | ISO/IEC 9594 or in ISO/IEC TR 10000-1:

AVA	Attribute Value Assertion
DAP	Directory Access Protocol
DIB	Directory Information Base
DIT	Directory Information Tree
DSA	Directory System Agent
DSP	Directory System Protocol
DUA	Directory User Agent
ISP	International Standardized Profile
ISPICS	ISP Implementation Conformance Statement
PRL	Profile Requirements List
RDN	Relative Distinguished Name

5 Conformance

Conformance to this part of ISO/IEC ISP 15126 concerns the type of information which a single DSA shall support.

Call for support of a certain type of information (e.g. object classes, attribute types) means that the conforming DSA shall be able to handle the information as described by this part of ISO/IEC ISP 15126.

This ability of a DSA shall be capable of being tested by setting up suitable test suites. The conformance statements of this part of ISO/IEC ISP 15126 lay down the range of information for suitable DSA test suites.

In practice, the behaviour of an actual DSA may depend on multiple conditions, like access control, or schema or other restrictions applied for administrative reasons. Therefore test suites, even if applicable in principle, cannot be performed successfully in all situations. A DSA is conformant according to this part of ISO/IEC ISP 15126 if the DSA, after suitable set-up, is able to successfully carry out test suites within the range of information defined in this part of ISO/IEC ISP 15126.

Note 1 : Suitable set-up is implied within this part of ISO/IEC ISP 15126.

Note 2 : This specification does not cover distributed aspects. In particular a DSA is not required to support any procedure specified in this part of ISO/IEC ISP 15126 in respect of operations for which it is not the performing DSA.

5.1 DSA Conformance

DSA conformance requirements involve

a) the support of object classes as specified in 7.1;

b) the support of attribute types and syntax checking as specified in 7.2 and 7.4;

c) the provision of matching rules as specified in 7.5;

d) the support of the DIT structure (Structure rules and Name forms) as specified in clause 6.

e) the provision of DIT Content Rules as specified in 7.3.

In addition, a PICS shall be provided stating support or non-support of each option on object classes and attribute types identified in A.6.4, name forms, structure rules and matching rules identified in A.6.5 and of the variant requirements on Teletex Strings and BMP String or Universal String as identified in A.6.5.4.

Notes :

1. It is not required of a DSA to be capable of removing or modifying entries immediately subordinate to the Root in a unified way. Conformant implementations shall be at least capable of holding entries which lie within the minimum DIT structure defined in A.6.5.1. Conformant implementations may, in addition, be capable of holding entries which lie outside this structure.

2. It is recommended that DSAs should not be limited to these minimum schema requirements, but should rather be configurable with respect to the subschema that can be required for supporting the specific Directory application.

3. This part of ISO/IEC ISP 15126 only requires a conformant implementation to be able to ensure compliance with the structure rules defined in this part of ISO/IEC ISP 15126. It is not required to be able to ensure compliance with the full set of structure rules defined in ITU-T Rec. X.521 | ISO/IEC 9594-7, annex B.

5.2 DUA conformance

DUAs capabilities are necessarily tied to user needs, which may vary. For instance some DUA will not support modify operations. However several features can be defined, to which a DUA may claim conformance:

- A DUA claiming support of an object class shall do it by

  a) being able at minimum to carry out rendition of the object class value in a manner appropriate to its user interface. In the context of a DUA for a human, this would mean rendition in a suitable graphic form.

  b) being able, if it supports add operations, to include in the request the correct values of the object class attribute, that is the object identifier of the structural object class and of its superclasses.

- A DUA claiming support of an attribute type shall do it by

  a) being able to receive and, in the context of a DUA for a human, to display correctly the attribute values completely and in all defined forms,

  b) being able to accept in a result an attribute type which is a subtype of the attribute it is asking for,

  c) being able, if it supports modify operations, to generate requests for adding and removing this attribute and its attribute values in all defined forms,

  d) being able, if it supports search operations, to use this attribute in a filter component appropriate to the attribute definition and supported matching rules,

  e) being able, if it supports such operations, to create a filter with „presence match".

- A DUA claiming support of a Matching Rule shall do it by

  being able to specify this matching rule in a search operation with extensibleMatch.

- A DUA claiming support of a DIT structure rule and the associated Name Form shall do it by

  a) being able to use this structure rule with all associated superior structure rules and the associated name form to compose the DN of an entry,

  b) being able, if it supports add operations, to use this structure rule and the associated name form in order to add leaf entries under all allowed superiors.

Support of a Name Form for a DUA does not require support of the corresponding named object class.

6 DIT Structure

The form of the DIT required by the administrative and naming authorities responsible of a given region/domain/subtree has to be specified with the help of

- the Name forms, which define which attributes are used to form the RDN of an entry
- the DIT Structure rules, which define the hierarchical relationship of entries.

6.1 Name forms

Implementations claiming conformance with this part of ISO/IEC ISP 15126 shall support name forms as listed in A.6.5.1.1 and 6.1.1.

Support of these name forms by a DSA conformant with this part of ISO/IEC ISP 15126 means that all the following conditions are fulfilled:

a) The DSA supports the named object class as described in 7.1.

b) The DSA is able to create an entry of specified object class, the RDN of which contains all mandatory attributes and each combination including none of the optional attributes indicated in the name form.

6.1.1 Additional Name Forms

The following additional Name Forms are defined for compatibility with the minimal DIT structure defined in ISO/IEC ISP 10616.

6.1.1.1 locality-OrganizationalUnit name form

The locality-Organizational Unit name form uses the attribute **localityName** for entries of object class **OrganizationalUnit.**

```
locOUNameForm NAME-FORM ::={
    NAMES              organizationalUnit
    WITH ATTRIBUTES    {localityName}
    AND OPTIONALLY     {organizationalUnitName}
    ID                 id-nf-locOUNameForm }
id-nf-locOUNameFormOBJECT IDENTIFIER      ::= { iso(1) standard(0)  fdi11(10616)
                                                  nameForm(15) 1 }
```

6.2 DIT Structure Rules

A DIT structure rule is the mechanism allowing the subschema administrative authority to specify/control the placement and naming of entries within the scope of a subschema.

Implementations conformant with this part of ISO/IEC ISP 15126 shall be capable of supporting a structure rule mechanism, for example as defined in ITU-T X.501 | ISO/IEC 9594-2, 12.6, and this part of ISO/IEC ISP 15126.

Support of this mechanism by a DSA conformant with this part of ISO/IEC ISP 15126 means that all the following conditions are fulfilled:

a) The DSA supports the name form indicated in the DIT structure rule as described in 6.1.

b) The DSA is able to create entries subordinate to all kinds of superiors governed by the superior structure rules contained in this DIT structure rule.

In addition, implementations conformant with this part of ISO/IEC ISP 15126 shall support the minimal DIT structure required in ISO/IEC ISP 10616. This minimal DIT structure is defined in 6.2.1, 6.2.2 and A.6.5.1.2 in terms of the structure rule definition formalism of ITU-T X.501 | ISO/IEC 9594-2, 12.6.

Note: A.6.5.1.2 is presented as a global structure rule table that rules the whole DIT. Hence it cannot be contained in a single subschema subentry.

If it is used for defining a DIT structure, the structure rule definition formalism has to be adapted as follows:

1. A DIT Structure Rule, as defined in ITU-T X.501 | ISO/IEC 9594-2, 12.6.5, is a specification provided by a subschema administrative authority which the Directory uses to control the placement and naming of entries within the scope of a subschema. As used to define a minimum DIT structure, the Structure Rule is used to specify a possible structure within the scope of the complete DIT. Therefore, it has no role in restricting the placement of entries.

2. A DIT Structure Rule, as defined in ITU-T X.501 | ISO/IEC 9594-2, 12.6.5, either specifies the superior structure rule for a new entry's superior, or requires that the superior entry be an autonomous administrative point. As used to define a minimum DIT structure, the role of the autonomous administrative point is taken by the root of the DIT. There is no concept of administrative point for this purpose.

6.2.1 Standard DIT Structure Rules

Implementations conformant with this part of ISO/IEC ISP 15126 shall support entries which are conformant with all standard structure rules listed in A.6.5.1.2.

Note 1: DSAs that intend to be first-level must be able to hold first-level entries. DSAs that are not so intended do not have to do so.

Note 2: A.6.5.1.2 lists the standard structure rules to be supported with the integer identifier defined in ITU-T X.521 | ISO/IEC 9594-7, Annex B. These identifier are arbitrary and have no standardized significance. They only have to be unique within the scope of the subschema.

The DSA's structure rules will typically differ from those in A.6.5.1.2.

Note 3: It is recommended that DSAs should not be limited to these minimum structure rules, but should rather be freely configurable with respect to the subschema to be supported.

6.2.2 Additional DIT Structure Rules

The following additional DIT structure rules are defined for compatibility with the minimal DIT structure defined in ISO/IEC ISP 10616.

Note : Some of these additional structure rules contain superior rules defined in ITU-T X.521 | ISO/IEC 9594-7, Annex B.

6.2.2.1 Locality

Attribute s**tateOrProvinceName** is used for naming.

The root is the immediate superior to entries of object class **locality.**

ispsr27 STRUCTURE-RULE ::={
NAME FORM sOPNameForm
ID 27}

Attribute **localityName** is used for naming.

locality can be the immediate superior to entries of object class **locality.**

ispsr28 STRUCTURE-RULE ::={
NAME FORM locNameForm
SUPERIOR RULES {sr26| ispsr27| ispsr28}
ID 28}

6.2.2.2 Organization

Attribute **organizationName** is used for naming.

locality can be the immediate superior of object class **organization**.

ispsr29 STRUCTURE-RULE ::={
NAME FORM orgNameForm
SUPERIOR RULES { ispsr27| ispsr28}
ID 29}

6.2.2.3 OrganizationalUnit

Attributes **organizationalUnitName**, or **localityName,** or **localityName** with **organizationalUnitName** are used for naming.

Organization and **OrganizationalUnit** can be the immediate superior to entries of object class **organizationalUnit**.

ispsr30 STRUCTURE-RULE ::={
NAME FORM orgUnitNameForm
SUPERIOR RULES {ispsr29| ispsr30| ispsr31}
ID 30}

ispsr31 STRUCTURE-RULE ::={
NAME FORM locQUNameForm
SUPERIOR RULES { sr2| sr3| sr4 | sr10| sr11| ispsr29| ispsr30| ispsr31}
ID 31}

6.2.2.4 Organizational Person

Attributes **commonName,** or **commonName** and **organizationalUnitName** are used for naming.

Organization and **OrganizationalUnit** can be the immediate superior to entries of object class **organizationalPerson**.

ispsr32 STRUCTURE-RULE ::={
NAME FORM orgPersonNameForm
SUPERIOR RULES {ispsr29| ispsr30| ispsr31}
ID 32}

6.2.2.5 Organizational Role

Attribute **commonName** is used for naming.

Organization and **OrganizationalUnit** can be the immediate superior to entries of object class **organizationalRole**.

ispsr33 STRUCTURE-RULE ::={
NAME FORM orgRoleNameForm
SUPERIOR RULES {ispsr29|ispsr30| ispsr31}
ID 33}

6.2.2.6 Group of Names

Attribute **commonName** is used for naming.

Locality, Organization and **OrganizationalUnit** can be the immediate superior to entries of object class **organizationalRole**.

ispsr34 STRUCTURE-RULE ::={
NAME FORM gonNameForm
SUPERIOR RULES { ispsr27| ispsr28| ispsr29| ispsr30| ispsr31}
ID 34}

6.2.2.7 Residential Person

Attributes **commonName,** or **commonName** and **streetAddress** are used for naming.

Locality can be the immediate superior to entries of object class **residentialPerson.**

ispsr35 STRUCTURE-RULE ::={
NAME FORM orgPersonNameForm
SUPERIOR RULES {ispsr27| ispsr28}
ID 35}

6.2.2.8 Application Process

Attribute **commonName** is used for naming.

Organization and **Organizational Unit** can be the immediate superior to entries of object class **applicationProcess**.

ispsr36 STRUCTURE-RULE ::={
NAME FORM applProcessNameForm
SUPERIOR RULES {ispsr29| ispsr30| ispsr31}
ID 36}

6.2.2.9 Application Entity

Attribute **commonName** is used for naming.

Organization, **Organizational Unit** and **applicationProcess** can be the immediate superior to entries of object class **applicationEntity**.

ispsr37 STRUCTURE-RULE ::={
NAME FORM applEntityNameForm
SUPERIOR RULES {sr2| sr3| sr4| sr10| sr11| ispsr29| ispsr30| ispsr31| sr24| sr25| ispsr36}
ID 37}

Note : The inclusion of superior structure rules 2,3,4 and 10,11,29,30,31 is not within the scope of IUT-T X.521 | ISO/IEC 9594-7, Annex B; it does however reflect the merging of Application Process and Application Entity implied by IUT-T X.521 | ISO/IEC 9594-7, Note in 6.12.

6.2.2.10 Device

Attribute **commonName** is used for naming.

organization and **OrganizationalUnit** can be the immediate superior to entries of object class **Device**.

ispsr38 STRUCTURE-RULE ::={
NAME FORM deviceNameForm
SUPERIOR RULES {ispsr29| ispsr30| ispsr31}
ID 38}

6.2.2.11 DSA

Attribute **commonName** is used for naming.

Application Process can be the immediate superior of object class **dSA**.

ispsr39 STRUCTURE-RULE ::={
NAME FORM dSANameForm
SUPERIOR RULES {sr24| sr25| ispsr36}
ID 39}

7 Content of Entries

7.1 Object Classes

7.1.1 Standard Object Classes

Standard object classes defined within ITU-T Rec. X.521 | ISO/IEC 9594-7 shall be supported as specified in A.6.4.1.1.

Support of standard object classes requires the DSA to be able to store, modify and retrieve, via Directory operations, an entry of its fragment of the DIT, if the entry is associated with supported object classes and the following conditions are fulfilled:

a) The entry lies within the DIT structure described in clause 6 and in A.6.5.1;

b) The entry contains all mandatory attributes as determined by its object classes - structural and auxiliaries if any - and/or the corresponding DITContentRule if any;

c) The entry contains no other than mandatory and optional attributes as defined by its object classes - structural and auxiliaries if any - and/or the corresponding DITContentRule if any.

d) The entry does not contain any optional attribute precluded in the corresponding DITContentRule if any.

e) The object class attribute of the entry only contains values for the auxiliary object classes and their superclasses allowed by the corresponding DITContentRule. If no DITContentRule is present, then this attribute only contains one value for the entry's structural object class and one value for each of its superclasses.

Conformant DSAs shall accept entries which explicitly indicate Top in their object class attribute. Indication of object class Top is optional according to ITU-T X.501 | ISO/IEC 9594-2, clause 12.3.2.

Support of a standard object class implies support of its mandatory attribute types (see A.6.4.2.1) and support of its optional attribute types (see A.6.4.2.1 and A.6.4.2.2) for which support is claimed for the DSA.

A conformant DSA shall reject requests for creation or modification of entries that as a consequence would not fulfil the condition b), c), d) or e).

In particular, a conformant DSA shall not accept entries which have additional attributes not identified by any of its object classes or by DIT Content rule

A conformant DSA may accept or reject requests for creation or modification of entries that as a consequence would not fulfil the condition a), depending on whether or not the scope of the subschema operated by the DSA exceeds the scope of the schema laid down in this part of ISO/IEC ISP 15126.

7.1.2 Additional Object Classes

The additional object classes defined for optional support by conformant DSA implementations are listed in A.6.4.1.2.

Support of an additional object class implies support of its attribute types (see A.6.4.2.2) for which support is claimed for the DSA.

Support of an auxiliary object class additionally implies support of the corresponding DIT content rule as defined in 7.3.

7.1.2.1 ISP Application Entity

The ISP Application Entity object class is used to define entries representing ISP related application entities. It describes information about underlying lower layer protocols and upper layer profiles which are implemented, AETitle and the supported transfer syntaxes of that application entity.

```
ispApplicationEntity    OBJECT-CLASS ::=  {
        SUBCLASS OF     {top}
        KIND            auxiliary
        MAY CONTAIN     ulProfileInformation |
                        applicationEntityOID |
                        transferSyntaxesSupported }
        ID              id-oc-ispApplicationEntity
id-oc-ispApplicationEntity  OBJECT IDENTIFIER     ::=  { iso(1) standard(0)  fdi11(10616)
                                                         object-class(6) 1 }
```

Note : This object class must be auxiliary since it may be required to be applicable to any subclass of Application Entity, e.g. DSA.

7.1.2.2 Use of the ISP Application Entity Object Class

As the ISP Application Entity object class is an auxiliary object class, entries shall not be created based on this object class only, but have to be combined with a structural object class.

The ISP Application Entity object class is intended to provide additional attributes to the Application Entity object class or any of its subclasses.

An implementation that claims conformance to the ISP Application Entity object class shall be able to store, modify and retrieve entries associated with the ISP Application Entity object class combined with the Application Entity object class and with the DSA object class.

7.2 Attribute Types

A DSA claiming conformance with this part of ISO/IEC ISP 15126 shall support an attribute type as follows:

a) The DSA shall perform, on the original inclusion or on a subsequent modification attempt of an attribute, the checking algorithm which is associated with the syntax of the attribute, when required (see 7.4);

b) The DSA shall check that the number of attribute values complies with the single-valued element of the attribute definition;

c) The DSA shall check that the attribute value(s) conform with the bounds defined in ITU-T X.520 annex C (which is not an integral part of ISO/IEC 9594-6);

d) The DSA shall support the matching rules, if any, that are directly associated with the elements of the attribute type definition or of its supertype attributes, and shall execute these matching rules in a manner that conforms with ITU-T X.520 | ISO/IEC 9594-6 as clarified in 7.5.

7.2.1 Standard Attributes Types

The attribute types listed in A.6.4.2.1 are defined in ITU-T Rec. X.520 | ISO/IEC 9594-6. They are used in conjunction with the standard object classes specified in A.6.4.1.1, as either mandatory or optional attributes. They shall be supported as specified in A.6.4.2.1.

7.2.2 Additional Attribute Types

The following additionally defined attribute types are defined for optional support by conformant DSA implementations (see also A.6.4.2.2).

7.2.2.1 Upper Layer Profile Information

The Upper Layer Profile Information attribute type associates with each application entity the object identifiers of the profiles which are implemented for that application entity.

```
ulProfileInformation ATTRIBUTE  ::=
    WITH SYNTAX                 OBJECT IDENTIFIER
    EQUALITY MATCHING RULE      objectIdentifierMatch
    ID                          id-at-ulProfileInformation
id-at-ulProfileInformation  OBJECT IDENTIFIER     ::=  { iso(1) standard(0)  fdi11(10616)
                                                        attributeType(5) 1}
```

7.2.2.2 Application Entity OID

The Application Entity OID attribute type specifies the object identifier which is assigned to the application entity.

```
applicationEntityOID ATTRIBUTE

    WITH SYNTAX                 OBJECT IDENTIFIER
    EQUALITY MATCHING RULE      objectIdentifierMatch
    SINGLE VALUE                TRUE
    ID                          id-at-applicationEntityOID

id-at-applicationEntityOID OBJECT IDENTIFIER     ::=  { iso(1) standard(0)  fdi11(10616)
                                                        attributeType(5) 2}
```

7.2.2.3 Transfer Syntaxes Supported

The Transfer Syntaxes Supported attribute type specifies the object identifier(s) of transfer syntax(es) and/or the encoding rules that the object (an OSI application entity) supports.

transferSyntaxesSupported ATTRIBUTE
WITH SYNTAX **OBJECT IDENTIFIER**
EQUALITY MATCHING RULE **objectIdentifierMatch**
ID **id-at- transferSyntaxesSupported**

id-at- transferSyntaxesSupported OBJECT IDENTIFIER ::= { iso(1) standard(0) fdi11(10616) attributeType(5) 3}

7.2.3 Collective attributes

Collective attributes are "user" attributes shared by the entries belonging to the same entry collection.

For Directory interrogation operations, collective attributes appear as entry attributes. But collective attributes cannot be added, modified or removed via the entry in which they appear; they must be administrated via their associated subentry.

If a collective attribute is to be visible in an entry, this attribute shall be included in a DIT content rule associated with the structural object class governing the entry.

Support of collective attributes is optional.

Implementations conformant with this part of ISO/IEC ISP 15126 and claiming conformance for "collective attributes" shall be capable of supporting the collective attributes mechanisms as defined in ITU-T X.501 | ISO/IEC 9594-2, 8.8. In addition such an implementation shall be capable of performing the related procedures as defined in ITU-T X.511 | ISO/IEC 9594-3, 7.6 and the ISO/IEC ISP 15125-3 (ADY21).

This concerns

- returning collective attributes in respect to Read and Search operations,
- supporting of collective attributes in Search filter,
- supporting of collective attributes in Compare operations.

Implementations claiming conformance to "collective attributes" must as a minimum be capable of supporting the set of attributes listed as "collective attributes" in ITU-T X.520 | ISO/IEC 9594-6, Annex A and in this part of ISO/IEC ISP 15126, A.6.4.2.3.

Support of collective attributes implies for an implementation support of DIT content rules as described in ITU-T X.501 | ISO/IEC 9594-2, 12.7 and of collective attribute subentries as described in ITU-T X.501 | ISO/IEC 9594-2, 13.6.

> Note 1: The definition of DIT content rules for the collective attributes listed in ITU-T X.520 | ISO/IEC 9594-6, Annex A, is out of scope of FDY11.
>
> Note 2: Procedures related to the operational attribute **collectiveExclusions** are described in ISO/IEC ISP 15125-3, (ADY21).

7.2.4 Attribute Hierarchy

Attribute hierarchy is the capability of deriving attribute subtypes from a generic attribute type called the supertype.

Implementations conformant with this part of ISO/IEC ISP 15126 and claiming conformance to "attribute hierarchy" shall be capable of supporting the attribute subtyping mechanism as defined in ITU-T X.501 | ISO/IEC 9594-2, 8.6 and 12.4.2.

In addition such an implementation shall be capable of performing the related procedures as defined in ITU-T X.511 | ISO/IEC 9594-3 and ISO/IEC ISP 15125-3, (ADY21).

This concerns

- returning attribute subtypes in respect to Read and Search operations,
- supporting of attribute subtypes in Search filter,
- supporting of attribute subtypes in Compare operations.

Implementations claiming conformance to "attribute hierarchy" must as a minimum be capable of supporting the attribute hierarchies defined in ITU-T X.520 | ISO/IEC 9594-6.

7.3 DIT Content Rules

A DIT content rule specifies the permissible content of entries belonging to a particular structural object class.

Implementations conformant with this part of ISO/IEC ISP 15126 shall be capable of supporting a Content rule mechanism, for example as defined in ITU-T X.501 | ISO/IEC 9594-2, 12.7.

Note: If the content rule mechanism defined in ITU-T X.501 | ISO/IEC 9594-2, 12.7 is supported, then Collective attributes shall be included in DIT content rules if they are to be permitted in an entry.

7.3.1 Specific DIT Content Rules

The following DIT content rules defined for optional support by conformant DSA implementations are listed in A.6.4.2.4.

7.3.1.1 Auxiliary object class ispApplicationEntity

The use of the auxiliary object class **ispApplicationEntity** for entries belonging to the structural object class **applicationEntity** has to be allowed by a DIT content rule. The following definition is an example of such a content rule:

cr1 CONTENT-RULE ::= {
STRUCTURAL OBJECT-CLASS applicationEntity
AUXILIARY OBJECT-CLASSES ispApplicationEntity}

7.3.1.2 Support of userPassword attributes

DSAs and organizationRole may require the support of userPassword attributes. The following DIT content rules are examples showing how to allow the use of this attribute for entries belonging to the structural object classes **organizationalRole** and **dSA**.

cr2 CONTENT-RULE ::= {
STRUCTURAL OBJECT-CLASS organizationalRole
MAY CONTAIN userPassword}

cr3 CONTENT-RULE ::= {
STRUCTURAL OBJECT-CLASS dSA
MAY CONTAIN userPassword}

7.4 Syntax Checking

Support of an attribute implies the ability within a modify operation to check values of a supported attribute type for syntactical correctness in compliance with limitations as defined by ITU-T X.520, annex C and additional rules stated in this clause.

7.4.1 Basic checking rules

If an equality matching rule is defined for an attribute type, any attribute value within a modify operation argument (AddEntry, ModifyEntry or ModifyDN) which is provided for holding shall be checked by a conformant DSA according to checking rules defined by the base standard and extended in this subclause. Additionally, those values within a purported name which are used for decision by a DSA in the name resolution process shall be checked.

Values which are to be propagated either within an argument or a result to another DSA, or which are to be resolved in the name resolution process by other DSAs, shall not, if checked, give rise to an error response by a conformant DSA.

Checks for attributes that support equality matching shall be performed for

a) compliance with the basic encoding rules as defined in ISO/IEC 8825 (ITU-T X.209) for the ASN.1 data type associated with the attribute syntax of the value;

b) compliance with ASN.1 data types (e.g. T.61 character set) as specified in the following clauses;

c) compliance with upper and lower bounds, when defined for the attribute syntax within the attribute type definition;

Note : Upper and lower bounds mean the maximal and minimal count of characters (not octets!) that are permitted in a string.

Checks for attributes that do not support equality matching may optionally be performed; i.e. checking is not mandatory (see ITU-T X.501 | ISO/IEC 9594-2, 12.4.4).

7.4.2 Checking of TeletexStrings

The following clause indicates how TeletexStrings shall be handled for checking.

Notes :

1. TeletexStrings and T61Strings are synonymous.

2. This clause identifies the use of character set registration entry 126, right-hand part of Latin/Greek, within attributes using the TeletexString attribute syntax. As this character set is not permitted by ISO/IEC 8824 to appear in the datatype TeletexString, support for character set registration entry 126 is optional.

- The following T.61 features and related encodings shall be supported within TeletexStrings in the context of the Directory:

  a) Sets G0, G1, C0, C1 only;

  b) No shifts shall be permitted;

  c) Designation sequences for the repertoire 102 (Teletex primary) shall be permitted only to G0;

  Designation sequences for the repertoires 103 (Teletex supplementary), 126 (right-hand part of Latin/Greek), 87 (Japanese) shall be permitted only to G1;

  No other designation sequences shall be permitted;

  d) Default designations and invocations shall be as follows:

  102 is designated to G0, and G0 is invoked to the left-hand part;

  103 is designated to G1, and G1 is invoked to the right-hand part;

  106 is designated to C0, and C0 is invoked to the left-hand (primary) control functions;

  107 is designated to C1, and C1 is invoked to the right-hand (supplementary) control functions;

  e) Designation sequences are only permitted at the beginning of strings.

- A consequence of these rules is:

  a) 102 is permanently mapped onto G0, which is in turn permanently mapped onto the left-hand part. No invocation (shift) is permitted;

  b) 103, 126, 87 are permitted to be mapped to G1 for use with the right-hand part only;

  c) If 103 is not supported, any use of the right-hand part must be preceded by an appropriate designation sequence.

  The support of 102 is mandatory; the support of 103, 126 and 87 is optional, subject to regional requirements (see A.6.5.4).

- The following shall not be permitted:

  a) Shifts LS0, LS1, LS2, LS3, LS1R, LS2R, LS3R, SS2, SS3;

  b) Designation sequences

  102 to G1, G2, G3;

  103, 126, 87 to G0, G2, G3;

  c) Format effectors BS, LF, FF, CR;

  d) Control sequences SUB, IGS;

  e) Presentation Control Functions;

  f) ESC sequences other than those given as permitted in the list above;

  g) Use of single-byte positions in 102 and 103 that are not assigned to graphic characters including diacriticals;

  h) Non-spacing elements not immediately followed by a graphic character;

  i) Non-spacing underline.

  TeletexStrings that contain elements that are not permitted by this list shall be regarded as an error. Other situations that (although not against T.61 rules) are not included in this list may be tolerated as a local option, or may generate an error.

- TeletexStrings that use an unsupported repertoire (e.g. 87 or 126) shall be tolerated, but any checking (e.g. for unassigned encodings) is optional.

7.4.3 Checking of Universal Strings

Support of Universal Strings is optional.

The level of support of Universal Strings is subject to regional requirements and defined in the following regional annexes:

- Annex I1: European Requirements

7.4.4 Checking of BMP Strings

Support of BMP-Strings is optional.

The level of support of BMP Strings is subject to regional requirements and defined in the following regional annexes:

- Annex I1: European Requirements

7.5 Matching rules

Implementations conformant with this part of ISO/IEC ISP 15126 shall support the matching rules as listed in A.6.4.2.

Additionally the following subclauses 7.5.1 and 7.5.2 indicate how directoryStrings shall be handled for matching.

7.5.1 Matching Directory strings for equality and substring

Two strings shall match for equality or substring , using a specified matching rule, if and only if

a) they satisfy the syntax specified for the matching rule,

b) they are identical when semantically compared name-by-name for each graphic character in the strings, subject to rules relating to

- Handling of initial, middle and final spaces,
- Case, if supported by the used character repertoire,

as defined for the corresponding matching rule,

and subject to the following character set specific rules described in 7.5.1.1.

The matching of two strings that contain (unknown) characters in an unsupported character set shall be subject to local options.

If a DSA does not support the matching rule for such an unknown character set, then it may perform the matching only if both strings are TeletexStrings or both strings are one of BMP or Universal strings.

If both are Teletex strings, the matching for characters on the right-hand side of the code table shall be octet-by-octet within the context of matching designators..

If both are BMP strings, the matching should be 2-octet-character by 2-octet-character.

If both are Universal strings, the matching should be 4-octet-character by 4-octet-character.

If one is a BMP string and the other one an Universal string, the matching should be 4-octet-character by 4-octet-character after padding each 2-octet-character of the BMP string by 2 octets with value 00.

Note : Support of matching for printable strings is always assumed. A printable character matches

- a character of the Teletex character set if it is identical with it,
- a character of the BMP or Universal character set if it is identical with it after padding with corresponding octets with value 00.

7.5.1.1 Character set specific rules

These rules apply for TeletexStrings, BMPStrings and UniversalStrings.

Note : The name of the characters defined in ISO/IEC 10646-1 are in brackets.

- Since „small d with stroke“ and „small eth, Icelandic“ map to the same capital „capital D with stroke, Icelandic eth“ both corresponding lower case letters shall be taken as matching. This avoids TeletexString matching being intransitive.

- „terminal sigma“ shall match „small Greek letter sigma“, and shall map to the same capital „capital Greek letter sigma“ (GREEK CAPITAL LETTER SIGMA).
- The omega and mu Greek letters in 103 shall match corresponding letters in 126.
- „soft hyphen“ (SOFT HYPHEN) shall be ignored for matching purposes.
- „no-break space“ (NO-BREAK SPACE) shall be taken as equivalent to an ordinary space.
- „ohm sign“ (OHM SIGN) and „micro sign“ (MICRO SIGN) shall match the corresponding greek letters.
- „small sharp s, German“ (LATIN SMALL LETTER SHARP S, German), shall match with ss.
- INCREMENT shall match with GREEK CAPITAL LETTER DELTA,
- N-ARY SUMMATION shall match with GREEK CAPITAL LETTER SIGMA.

7.5.2 Matching Directory strings for ordering

If Directory strings of different types have to be matched for ordering, the necessary collation rules may be subject to local rules.

Annex A
(normative)
Profile Requirements for a single DSA

In the event of a discrepancy becoming apparent in the body of this part of ISO/IEC ISP 15126 and the tables in this annex, this annex is to take precedence.

This annex specifies the constraints and characteristics of this part of ISO/IEC ISP 15126 on what shall or may appear in an implementor's PICS for an implementation conformant to this part of ISO/IEC ISP 15126.

This annex is based on the PICS Proforma for the Directory Access Protocol 1993 Standard. It uses only a selection of the tables of this document which are necessary for the specification of this part of ISO/IEC ISP 15126. The numbering of the base PICS Proforma is retained in order to help an implementor complete the respective ISPICS Proforma.

The abbreviations used in the heading of the tables in this Annex are:

D - conformance requirement as defined in the base standard

P - conformance requirement as defined in this part of ISO/IEC ISP 15126

The terminology of conformance requirements is used as defined in 3.2.

A.1 Identification of the implementation

A.1.1 Identification of PICS

(void)

A.1.2 Identification of the implementation and/or system

Item	Question	Response
1	Implementation Name	(void)
2	Version Number	(void)
3	Machine Name	(void)
4	Machine Version Number	(void)
5	Operating System Name	(void)
6	Operating System Version No.	(void)
7	Special Configuration	Note 1
8	Can the DSA be configured as a firstlevelDSA	yes/no
9	Can the DSA be used as a repository for strong Authentication information?	yes/no
10	Does the DSA support BMP strings?	yes/no
11	Does the DSA support Universal Strings?	yes/no
12	Does the DSA support the Content Rule mechanism defined in ITU-T X.501 | ISO/IEC 9594-2, 12.7?	yes/no
13	Does the DSA support the Structure Rule mechanism defined in ITU-T X.501 | ISO/IEC 9594-2, 12.6?	yes/no
14	Does the DSA return Collective Attributes in respect to Read and Search operations?	yes/no
15	Does the DSA fully support Collective Attributes in Search filter?	yes/no
16	Does the DSA fully support Collective Attributes in Compare operations?	yes/no
17	Does the DSA return Attribute Subtypes in respect to Read and Search operations?	yes/no
18	Does the DSA fully support Attribute Subtypes in Search filter?	yes/no
19	Does the DSA fully support Attribute Subtypes in Compare operations?	yes/no

Note 1: Special configuration can be
firstlevelDSA
or nothing, which assumes that the DSA is not configured as a firstlevel DSA.

The following predicates are defined:

p_firstlevel = A.1.2/8 AND special configuration in A.1.2/7 is firstlevelDSA
p_strong_rep = A.1.2/9
p_collective_Attr = A.1.2/14 OR A.1.2/15 OR A.1.2/16
p_Attr_subtyping = A.1.2/17 OR A.1.2/18 OR A.1.2/19

A.1.3 Identification of the system supplier and/or test laboratory client

(void)

A.2 to A.5

No requirements stated in this part of ISO/IEC ISP 15126.

A.6 Capabilities and options

A.6.1 to A.6.3

No requirements stated in this part of ISO/IEC ISP 15126.

A.6.4 Directory schema

A.6.4.1 Object classes

A.6.4.1.1 Standard object classes

The table below indicates the conformance requirements of this part of ISO/IEC ISP 15126 on standard object classes.

Ref. no.	Object Class	D	P	Note
1	top	m	m	An entry shall not only belong to the top object class
2	alias	m	m	
3	country	o	m	
4	locality	o	m	
5	organization	o	m	
6	organizationalUnit	o	m	
7	person	o	m	
8	organizationalPerson	o	m	
9	organizationalRole	o	m	
10	groupOfNames	o	m	
11	groupOfUniqueNames	o	m	not present in 88 edition
12	residentialPerson	o	m	
13	applicationProcess	o	m	
14	applicationEntity	o	m	
15	dSA	m	m	
16	device	o	m	
17	strongAuthenticationUser	o	c1	
18	certificationAuthority	o	c1	

Conditionals:
c1: if p_strong_rep then m else o.

A.6.4.1.2 Other object classes

The table below indicates the conformance requirements of this part of ISO/IEC ISP 15126 on other object classes as defined in 7.1.2.

Ref. no.	Object Class	D	P	Note
1	ispApplicationEntity	-	o	see 7.1.2

A.6.4.2 Attribute types

A.6.4.2.1 Standard attribute types

The table below indicates the conformance requirements of this part of ISO/IEC ISP 15126 on standard attribute types.

Ref. no.	Attribute type	D	P	Note
1	objectClass	m	m	
2	aliasedEntryName	o	m	
3	knowledgeInformation	o	o	
4	name	o	m	not present in 88 edition
5	commonName	o	m	
6	surname	o	m	
7	givenName	o	m	not present in 88 edition
8	initials	o	m	not present in 88 edition
9	generationQualifier	o	m	not present in 88 edition
10	uniqueIdentifier	o	c1	not present in 88 edition
11	dnQualifier	o	m	not present in 88 edition
12	serialNumber	o	m	
13	countryName	o	m	
14	localityName	o	m	
15	stateOrProvinceName	o	m	
16	streetAddress	o	m	
17	houseIdentifier	o	m	not present in 88 edition
18	organizationName	o	m	
19	organizationalUnitName	o	m	
20	title	o	m	
21	description	o	m	
22	searchGuide	o	m	
23	enhancedSearchguide	o	m	not present in 88 edition
24	businessCategory	o	m	
25	postalAddress	o	m	
26	postalCode	o	m	
27	postOfficeBox	o	m	
28	physicalDeliveryOfficeName	o	m	
29	telephoneNumber	o	m	
30	telexNumber	o	m	

31	teletexTerminalIdentifier	o	m	
32	facsimileTelephoneNumber	o	m	
33	x121Address	o	m	
34	internationalISDNNumber	o	m	
35	registeredAddress	o	m	
36	destinationIndicator	o	m	
37	preferredDeliveryMethod	o	m	
38	presentationAddress	o	m	
39	supportedApplicationContext	o	m	
40	protocolInformation	o	m	not present in 88 edition
41	distinguishedName	o	m	not present in 88 edition
42	member	o	m	
43	uniqueMember	o	c1	not present in 88 edition
44	owner	o	m	
45	roleOccupant	o	m	
46	seeAlso	o	m	
47	userPassword	o	m	
48	userCertificate	o	c1	
49	cACertificate	o	c1	
50	authorityRevocationList	o	c1	
51	certificateRevocationList	o	c1	
52	crossCertificatePair	o	c1	

Conditionals:
c1 : if p_strong_rep then m else o.

A.6.4.2.2 Other attribute types

The table below indicates the conformance requirements of this part of ISO/IEC ISP 15126 on other attribute types as defined in 7.2.2.

Ref. no.	Attribute type	D	P	Note
1	ulProfileInformation	-	o	see 7.2.2
2	applicationEntityOID	-	o	see 7.2.2
3	transferSyntaxesSupported	-	o	see 7.2.2

A.6.4.2.3 Collective attribute types

The table below indicates the conformance requirements of this part of ISO/IEC ISP 15126 on collective attribute types.

Ref. no.	Attribute type	D	P	Note
1	collectiveLocalityName	o	o	
2	collectiveStateOrProvinceName	o	o	
3	collectiveStreetAddress	o	o	
4	collectiveOrganizationName	o	o	
5	collectiveOrganizationalUnitName	o	o	
6	collectivePostalAddress	o	o	
7	collectivePostalCode	o	o	

8	collectivePostOfficeBox	o	o	
9	collectivePhysicalDeliveryOfficeName	o	o	
10	collectiveTelephoneNumber	o	o	
11	collectiveTelexNumber	o	o	
12	collectiveTeletexTerminalIdentifier	o	o	
13	collectiveFacsimileTelephoneNumber	o	o	
14	collectiveInternationalISDNNumber	o	o	

A.6.4.2.4 DIT content rules

The table below indicates the conformance requirements of this part of ISO/IEC ISP 15126 on DIT content rules.

Note : Conformance is to be understood the following way: the following content rules do not need to be supported without any change, but have to be included in the rules defined by the Domain Administrator.

Ref. no.	content rule	D	P	Note
1	auxiliary object class ispApplicationEntity	-	o	see 7.3.1.1
2	userPassword in organizationalRole	-	o	see 7.3.1.2
3	userPassword in dSA	-	o	see 7.3.1.2

A.6.5 Other information

A.6.5.1 Minimum set of structure rules and name forms

The tables below defines the minimum set of name forms and structure rules for the DIT.

A.6.5.1.1 Name forms

Ref. no.	Name form	D	P	Note
1	countryNameForm	o	c2	
2	locNameForm	o	m	
3	sOPNameForm	o	m	
4	orgNameForm	o	m	
5	orgUnitNameForm	o	m	
6	personNameForm	o	m	
7	orgPersonNameForm	o	m	
8	orgRolenameForm	o	m	
9	gONNameForm	o	m	
10	resPersonNameForm	o	m	
11	applProcessNameForm	o	m	
12	applEntityNameForm	o	m	
13	dSANameForm	o	m	
14	deviceNameForm	o	m	

Conditionals:
c2 : if p_firstlevel then m else o.

A.6.5.1.2 Structure rules

The table below defines the minimum set of structure rules to be supported by a DSA claiming conformance with this part of ISO/IEC ISP 15126.

Note : Conformance is to be understood as defined in 6.2 of this part of ISO/IEC ISP 15126, it means the capability of creating entries rather than the support of the structure rule alone.

The structure rule names and integer identifier are taken from ISO/IEC 9594-7/X.521 Annex B and 6.2.2. of this part of ISO/IEC ISP 15126.

The order of the structure rules is based on the order of the structural object classes in ISO/IEC 9594-7/X.521.

Ref. no.	structure rule name	structure rule id	D	P	Note
1	sr1	1	o	c2	
2	sr2	2	o	c2	
3	sr3	3	o	m	
4	sr4	4	o	m	
5	ispsr29	29	-	m	
6	ispsr27	27	-	c2	
7	sr26	26	o	m	
8	sr5	5	o	c2	
9	sr6	6	o	m	
10	sr7	7	o	m	see note 2
11	ispsr28	28	-	m	see note 2
12	sr10	10	o	m	
13	sr11	11	o	m	see note 3
14	sr12	12	o	m	
15	ispsr30	30	-	m	see note 3
16	ispsr31	31	-	m	see note 1
17	sr13	13	o	m	
18	sr14	14	o	m	
19	ispsr32	32	-	m	
20	sr15	15	o	m	
21	sr16	16	o	m	
22	ispsr33	33	-	m	
23	sr17	17	o	m	
24	sr18	18	o	m	
25	sr19	19	o	m	
26	ispsr34	34	-	m	
27	sr20	20	o	m	
28	ispsr35	35	-	m	
29	sr24	24	o	m	
30	sr25	25	o	m	
31	ispsr36	36	-	m	
32	sr21	21	o	m	
33	ispsr37	37	-	m	
34	sr22	22	o	m	
35	sr23	23	o	m	
36	ispsr38	38	-	m	
37	ispsr39	39	-	m	

Conditionals:

c2 : if p_firstlevel then m else o.

NOTES

1. IUT-T Rec. X.500 series | ISO/IEC 9594 suggests that entries of object class locality can be immediate subordinates of organization entries. It is suggested that this part of ISO/IEC ISP 15126 use organizational unit entries named by locality instead, as this seems to be the appropriate semantic of such entries. Even if the organizational unit is identified by a locality name, it is in fact an organizational unit.

2. Although the recursive nature of structure rule 7 specifies a chain with an arbitrary number of locality entries, the minimum set contains no more than 5 locality entries in a chain, i.e. up to 5 localities in a chain shall be supported. This does not prevent conformant DSAs from supporting more than 5 localities in a chain.

3. Although the recursive nature of structure rule 11 specifies a chain with an arbitrary number of organitzational unit entries, the minimum set contains no more than 8 organizational unit entries in a chain, i.e. up to 8 organizational units in a chain shall be supported. This does not prevent conformant DSAs from supporting more than 8 organizational units in a chain.

A.6.5.2 Matching rules

The supplier of the implementation shall indicate, in the following table, the matching rules defined in ISO/IEC 9594-6 for which support is claimed:

Ref. No.	Matching Rule	D	P	Note
1	caseIgnoreMatch	o	m	
2	caseIgnoreOrderingMatch	o	o	
3	caseIgnoreSubstringsMatch	o	m	
4	caseExactMatch	o	m	
5	caseExactOrderingMatch	o	m	
6	caseExactSubstringMatch	o	m	
7	numericStringMatch	o	m	
8	numericStringOrderingMatch	o	m	
9	numericStringSubstringsMatch	o	m	
10	caseIgnoreListMatch	o	m	
11	caseIgnoreListSubstringsMatch	o	m	
12	booleanMatch	o	m	
13	integerMatch	o	m	
14	integerOrderingMatch	o	m	
15	bitStringMatch	o	m	
16	octetStringMatch	o	m	
17	octetStringOrderingMatch	o	o	
18	octetStringSubStringsMatch	o	m	
19	telephoneNumberMatch	o	m	
20	telephoneNumberSubsstringsMatch	o	m	
21	presentationAddressMatch	o	m	
22	uniqueMemberMatch	o	c1	
23	protocolInformationMatch	o	m	
24	uTCTimeMatch	o	m	
25	uTCTimeOrderingMatch	o	o	
26	genreralizedTimeMatch	o	m	
27	generalizedTimeOrderingMatch	o	o	
28	integerFirstComponentMatch	o	m	

29	objectIdentifierFirstComponentMatch	o	m	
30	directoryStringFirstComponentMatch	o	m	
31	wordMatch	o	o	
32	keywordMatch	o	o	
33	objectIdentifierMatch	o	m	
34	distinguishedNameMatch	o	m	
35	accessPointMatch	o	o	
36	masterAndShadowAccessPointMatch	o	o	
37	supplierAndConsumerMatch	o	o	
38	supplierOrConsumerInformationMatch	o	o	

Conditionals:

c1: if p_strong_rep then m else o.

A.6.5.3 Requirements for support of character sets

Support of Printable String is mandatory in order to ensure a minimum level of interworking.

Support of Teletex String is defined by the following table in terms of several predefined variants.

Variant	Registration number 102	Registration number 103	Registration number 126	Registration number 87
1	m	o	o	o
2	m	m	o	o

Support of BMPString and UniversalString is optional.

Annex B
(normative)
Profile Requirements for a DUA

In the event of a discrepancy becoming apparent in the body of this part of ISO/IEC ISP 15126 and the tables in this annex, this annex is to take precedence.

This annex specifies the constraints and characteristics of this part of ISO/IEC ISP 15126 on what shall or may appear in an implementor's PICS for an implementation conformant to this part of ISO/IEC ISP 15126.

This annex is based on the PICS Proforma for the Directory Access Protocol 1993 Standard. It uses only a selection of the tables of this document which are necessary for the specification of this part of ISO/IEC ISP 15126. The numbering of the base PICS Proforma is retained in order to help an implementor complete the respective ISPICS Proforma.

The abbreviations used in the heading of the tables in this Annex are:

D - conformance requirement as defined in the base standard

P - conformance requirement as defined in this part of ISO/IEC ISP 15126

The terminology of conformance requirements is used as defined in 3.2.

B.1 Identification of the implementation

B.1.1 Identification of PICS

(void)

B.1.2 Identification of the implementation and/or system

Item	Question	Response
1	Implementation Name	(void)
2	Version Number	(void)
3	Machine Name	(void)
4	Machine Version Number	(void)
5	Operating System Name	(void)
6	Operating System Version No.	(void)
7	Does the DUA support strongAuthentication?	yes/no
8	Does the DUA support BMP strings?	yes/no
9	Does the DUA support Universal Strings?	yes/no
10	Does the DUA support Attribute Subtypes in respect to Read and Search operations?	yes/no

The following predicates are defined:

p_strong = A.1.2/9
p_Attr_subtyping = A.1.2/10

B.1.3 Identification of the system supplier and/or test laboratory client

(void)

B.2 to B.5

No requirements stated in this part of ISO/IEC ISP 15126.

B.6 Capabilities and options

B.6.1 to B.6.3

No requirements stated in this part of ISO/IEC ISP 15126.

B.6.4 Directory schema

B.6.4.1 Object classes

B.6.4.1.1 Standard object classes

The table below indicates the conformance requirements of this part of ISO/IEC ISP 15126 on standard object classes.

Ref. no.	Object Class	D	P	Note
1	top	m	m	An entry shall not only belong to the top object class
2	alias	m	m	
3	country	o	m	
4	locality	o	m	
5	organization	o	m	
6	organizationalUnit	o	m	
7	person	o	m	
8	organizationalPerson	o	m	
9	organizationalRole	o	m	
10	groupOfNames	o	m	
11	groupOfUniqueNames	o	m	not present in 88 edition
12	residentialPerson	o	m	
13	applicationProcess	o	m	
14	applicationEntity	o	m	
15	dSA	m	m	
16	device	o	m	
17	strongAuthenticationUser	o	c1	
18	certificationAuthority	o	c1	

Conditionals:

c1: if p_strong then m else o.

B.6.4.1.2 Other object classes

The table below indicates the conformance requirements of this part of ISO/IEC ISP 15126 on other object classes as defined in 7.1.2.

Ref. no.	Object Class	D	P	Note
1	ispApplicationEntity	-	o	see 7.1.2

B.6.4.2 Attribute types

B.6.4.2.1 Standard attribute types

The table below indicates the conformance requirements of this part of ISO/IEC ISP 15126 on standard attribute types.

Ref. no.	Attribute type	D	P	Note
1	objectClass	m	m	
2	aliasedEntryName	o	m	
3	knowledgeInformation	o	o	
4	name	o	m	not present in 88 edition
5	commonName	o	m	
6	surname	o	m	
7	givenName	o	m	not present in 88 edition
8	initials	o	m	not present in 88 edition
9	generationQualifier	o	m	not present in 88 edition
10	uniqueIdentifier	o	c1	not present in 88 edition
11	dnQualifier	o	m	not present in 88 edition
12	serialNumber	o	m	
13	countryName	o	m	
14	localityName	o	m	
15	stateOrProvinceName	o	m	
16	streetAddress	o	m	
17	houseIdentifier	o	m	not present in 88 edition
18	organizationName	o	m	
19	organizationalUnitName	o	m	
20	title	o	m	
21	description	o	m	
22	searchGuide	o	m	
23	enhancedSearchguide	o	m	not present in 88 edition
24	businessCategory	o	m	
25	postalAddress	o	m	
26	postalCode	o	m	
27	postOfficeBox	o	m	
28	physicalDeliveryOfficeName	o	m	
29	telephoneNumber	o	m	
30	telexNumber	o	m	
31	teletexTerminalIdentifier	o	m	
32	facsimileTelephoneNumber	o	m	
33	x121Address	o	m	
34	internationalISDNNumber	o	m	
35	registeredAddress	o	m	
36	destinationIndicator	o	m	
37	preferredDeliveryMethod	o	m	
38	presentationAddress	o	m	

39	supportedApplicationContext	o	m	
40	protocolInformation	o	m	not present in 88 edition
41	distinguishedName	o	m	not present in 88 edition
42	member	o	m	
43	uniqueMember	o	c1	not present in 88 edition
44	owner	o	m	
45	roleOccupant	o	m	
46	seeAlso	o	m	
47	userPassword	o	m	
48	userCertificate	o	c1	
49	cACertificate	o	c1	
50	authorityRevocationList	o	c1	
51	certificateRevocationList	o	c1	
52	crossCertificatePair	o	c1	

Conditionals:

c1 : if p_strong then m else o.

B.6.4.2.2 Other attribute types

The table below indicates the conformance requirements of this part of ISO/IEC ISP 15126 on other attribute types as defined in 7.2.2.

Ref. no.	Attribute type	D	P	Note
1	ulProfileInformation	-	o	see 7.2.2
2	applicationEntityOID	-	o	see 7.2.2
3	transferSyntaxesSupported	-	o	see 7.2.2

B.6.4.2.3 Collective attribute types

The table below indicates the conformance requirements of this part of ISO/IEC ISP 15126 on collective attribute types.

Ref. no.	Attribute type	D	P	Note
1	collectiveLocalityName	o	o	
2	collectiveStateOrProvinceName	o	o	
3	collectiveStreetAddress	o	o	
4	collectiveOrganizationName	o	o	
5	collectiveOrganizationalUnitName	o	o	
6	collectivePostalAddress	o	o	
7	collectivePostalCode	o	o	
8	collectivePostOfficeBox	o	o	
9	collectivePhysicalDeliveryOfficeName	o	o	
10	collectiveTelephoneNumber	o	o	
11	collectiveTelexNumber	o	o	
12	collectiveTeletexTerminalIdentifier	o	o	
13	collectiveFacsimileTelephoneNumber	o	o	
14	collectiveInternationalISDNNumber	o	o	

B.6.4.2.4 DIT content rules

(void)

B.6.5 Other information

(void)