INTERNATIONAL STANDARD

ISO/IEC 9594-7

Fifth edition
2005-12-15

Information technology — Open Systems Interconnection — The Directory: Selected object classes

Technologies de l'information — Interconnexion de systèmes ouverts (OSI) — L'annuaire: Classes d'objets sélectionnées

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 9594-7 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems,* in collaboration with ITU-T. The identical text is published as ITU-T Rec. X.521.

This fifth edition of ISO/IEC 9594-7 constitutes a technical revision of the fourth edition (ISO/IEC 9594-7:2001), which is provisionally retained in order to support implementations based on the fourth edition.

ISO/IEC 9594 consists of the following parts, under the general title *Information technology — Open Systems Interconnection — The Directory*:

— *Part 1: Overview of concepts, models and services*

— *Part 2: Models*

— *Part 3: Abstract service definition*

— *Part 4: Procedures for distributed operation*

— *Part 5: Protocol specifications*

— *Part 6: Selected attribute types*

— *Part 7: Selected object classes*

— *Part 8: Public-key and attribute certificate frameworks*

— *Part 9: Replication*

— *Part 10: Use of systems management for administration of the Directory*

Introduction

This Recommendation | International Standard, together with other Recommendations | International Standards, has been produced to facilitate the interconnection of information processing systems to provide directory services. A set of such systems, together with the directory information that they hold, can be viewed as an integrated whole, called the *Directory*. The information held by the Directory, collectively known as the Directory Information Base (DIB), is typically used to facilitate communication between, with or about objects such as application entities, people, terminals, and distribution lists.

The Directory plays a significant role in Open Systems Interconnection, whose aim is to allow, with a minimum of technical agreement outside of the interconnection standards themselves, the interconnection of information processing systems:

- from different manufacturers;
- under different managements;
- of different levels of complexity; and
- of different ages.

This Recommendation | International Standard defines a number of attribute sets and object classes which may be found useful across a range of applications of the Directory.

This Recommendation | International Standard provides the foundation frameworks upon which industry profiles can be defined by other standards groups and industry forums. Many of the features defined as optional in these frameworks may be mandated for use in certain environments through profiles. This fifth edition technically revises and enhances, but does not replace, the fourth edition of this Recommendation | International Standard. Implementations may still claim conformance to the fourth edition. However, at some point, the fourth edition will not be supported (i.e., reported defects will no longer be resolved). It is recommended that implementations conform to this fifth edition as soon as possible.

This fifth edition specifies versions 1 and 2 of the Directory protocols.

The first and second editions specified only version 1. Most of the services and protocols specified in this edition are designed to function under version 1. However some enhanced services and protocols, e.g., signed errors, will not function unless all Directory entities involved in the operation have negotiated version 2. Whichever version has been negotiated, differences between the services and between the protocols defined in the five editions, except for those specifically assigned to version 2, are accommodated using the rules of extensibility defined in ITU-T Rec. X.519 | ISO/IEC 9594-5.

Annex A, which is an integral part of this Recommendation | International Standard, provides an ASN.1 module containing all of the type and value definitions which appear in this Recommendation | International Standard.

Annex B, which is not an integral part of this Recommendation | International Standard, provides some common naming and structure rules which may or may not be used by administrative authorities.

Annex C, which is not an integral part of this Recommendation | International Standard, lists the amendments and defect reports that have been incorporated to form this edition of this Recommendation | International Standard.

INTERNATIONAL STANDARD
ITU-T RECOMMENDATION

Information technology – Open Systems Interconnection – The Directory: Selected object classes

SECTION 1 – GENERAL

1 Scope

This Recommendation | International Standard defines a number of object classes and name forms which may be found useful across a range of applications of the Directory. The definition of an object class involves listing a number of attribute types which are relevant to objects of that class. The definition of a name form involves naming the object class to which it applies and listing the attributes to be used in forming names for objects of that class. These definitions are used by the administrative authority which is responsible for the management of the directory information.

Any administrative authority can define its own object classes or subclasses and name forms for any purpose.

NOTE 1 – Those definitions may or may not use the notation specified in ITU-T Rec. X.501 | ISO/IEC 9594-2.

NOTE 2 – It is recommended that an object class defined in this Recommendation | International Standard, or a subclass derived from one, or a name form defined in this Recommendation | International Standard, be used in preference to the generation of a new one, whenever the semantics is appropriate for the application.

Administrative authorities may support some or all the selected object classes and name forms, and may also add additional ones.

All administrative authorities shall support the object classes which the directory uses for its own purpose (the top, alias and DSA object classes).

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent editions of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

- ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model.*
- ITU-T Recommendation X.500 (2005) | ISO/IEC 9594-1:2005, *Information technology – Open Systems Interconnection – The Directory: Overview of concepts, models and services*.
- ITU-T Recommendation X.501 (2005) | ISO/IEC 9594-2:2005, *Information technology – Open Systems Interconnection – The Directory: Models*.
- ITU-T Recommendation X.509 (2005) | ISO/IEC 9594-8:2005, *Information technology – Open Systems Interconnection – The Directory: Public-key and attribute certificate frameworks.*
- ITU-T Recommendation X.511 (2005) | ISO/IEC 9594-3:2005, *Information technology – Open Systems Interconnection – The Directory: Abstract service definition.*
- ITU-T Recommendation X.518 (2005) | ISO/IEC 9594-4:2005, *Information technology – Open Systems Interconnection – The Directory: Procedures for distributed operation.*
- ITU-T Recommendation X.519 (2005) | ISO/IEC 9594-5:2005, *Information technology – Open Systems Interconnection – The Directory: Protocol specifications.*

- ITU-T Recommendation X.520 (2005) | ISO/IEC 9594-6:2005, *Information technology – Open Systems Interconnection – The Directory: Selected attribute types.*
- ITU-T Recommendation X.525 (2005) | ISO/IEC 9594-9:2005, *Information technology – Open Systems Interconnection – The Directory: Replication.*
- ITU-T Recommendation X.530 (2005) | ISO/IEC 9594-10:2005, *Information technology – Open Systems Interconnection – The Directory: Use of systems management for administration of the Directory.*
- ITU-T Recommendation X.680 (2002) | ISO/IEC 8824-1:2002, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*
- ITU-T Recommendation X.681 (2002) | ISO/IEC 8824-2:2002, *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification.*
- ITU-T Recommendation X.682 (2002) | ISO/IEC 8824-3:2002, *Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification.*
- ITU-T Recommendation X.683 (2002) | ISO/IEC 8824-4:2002, *Information technology – Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications.*

3 Definitions

For the purposes of this Recommendation | International Standard, the following definitions apply.

3.1 Communication Model definitions

The following terms are defined in ITU-T Rec. X.519 | ISO/IEC 9594-5.

a) *application-entity*;

b) *application process*.

3.2 Directory Model definitions

The following terms are defined in ITU-T Rec. X.501 | ISO/IEC 9594-2:

a) *attribute*;

b) *attribute type*;

c) *Directory Information Tree (DIT)*;

d) *Directory System Agent (DSA)*;

e) *attribute set*;

f) *entry*;

g) *name*;

h) *object class*;

i) *subclass*;

j) *name form*;

k) *structure rule*.

4 Conventions

With minor exceptions, this Directory Specification has been prepared according to the *Rules for presentation of ITU-T | ISO/IEC common text*, November 2001.

The term "Directory Specification" (as in "this Directory Specification") shall be taken to mean ITU-T Rec. X.521 | ISO/IEC 9594-7. The term "Directory Specifications" shall be taken to mean the X.500-series Recommendations and all parts of ISO/IEC 9594.

This Directory Specification uses the term *first edition systems* to refer to systems conforming to the first edition of the Directory Specifications, i.e., the 1988 edition of the series of CCITT X.500 Recommendations and the ISO/IEC 9594:1990 edition. This Directory Specification uses the term *second edition systems* to refer to systems conforming to the second edition of the Directory Specifications, i.e., the 1993 edition of the series of ITU-T X.500 Recommendations and the ISO/IEC 9594:1995 edition. This Directory Specification uses the term *third edition systems* to refer to systems conforming to the third edition of the Directory Specifications, i.e., the 1997 edition of the series of

ITU-T X.500 Recommendations and the ISO/IEC 9594:1998 edition. This Directory Specification uses the term *fourth edition systems* to refer to systems conforming to the fourth edition of the Directory Specifications, i.e., the 2001 editions of ITU-T Recs X.500, X.501, X.511, X.518, X.519, X.520, X.521, X.525, and X.530, the 2000 edition of ITU-T Rec. X.509, and parts 1-10 of the ISO/IEC 9594:2001 edition.

This Directory Specification uses the term *fifth edition systems* to refer to systems conforming to the fifth edition of the Directory Specifications, i.e., the 2005 editions of ITU-T Recs X.500, X.501, X.509, X.511, X.518, X.519, X.520, X.521, X.525, and X.530 and parts 1-10 of the ISO/IEC 9594:2005 edition.

This Directory Specification presents ASN.1 notation in the bold Helvetica typeface. When ASN.1 types and values are referenced in normal text, they are differentiated from normal text by presenting them in the bold Helvetica typeface. The names of procedures, typically referenced when specifying the semantics of processing, are differentiated from normal text by displaying them in bold Times. Access control permissions are presented in italicized Times.

Object classes and name forms are defined in this Directory Specification as values of the **OBJECT-CLASS** and **NAME-FORM** information object classes defined in ITU-T Rec. X.501 | ISO/IEC 9594-2.

SECTION 2 – SELECTED OBJECT CLASSES

5 Definition of useful attribute sets

5.1 Telecommunication attribute set

This set of attributes is used to define those which are commonly used for business communications.

```
TelecommunicationAttributeSet ATTRIBUTE  ::= {
        facsimileTelephoneNumber |
        internationalISDNNumber |
        telephoneNumber |
--      teletexTerminalIdentifier |        Attribute type has been deleted
        telexNumber |
        preferredDeliveryMethod |
        destinationIndicator |
        registeredAddress |
        x121Address }
```

5.2 Postal attribute set

This set of attributes is used to define those which are directly associated with postal delivery.

```
PostalAttributeSet  ATTRIBUTE  ::= {
        physicalDeliveryOfficeName |
        postalAddress |
        postalCode |
        postOfficeBox |
        streetAddress }
```

5.3 Locale attribute set

This set of attributes is used to define those which are commonly used for search purposes to indicate the locale of an object.

```
LocaleAttributeSet  ATTRIBUTE  ::= {
        localityName |
        stateOrProvinceName |
        streetAddress }
```

5.4 Organizational attribute set

This set of attributes is used to define the attributes that an organization or organizational unit may typically possess.

```
OrganizationalAttributeSet  ATTRIBUTE  ::= {
        description |
        LocaleAttributeSet |
        PostalAttributeSet |
        TelecommunicationAttributeSet |
        businessCategory |
        seeAlso |
        searchGuide |
        userPassword }
```

6 Definition of selected object classes

6.1 Country

A *Country* object class is used to define country entries in the DIT.

```
country  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { countryName }
```

```
        MAY CONTAIN     { description | searchGuide }
        ID              id-oc-country }
```

6.2 Locality

The *Locality* object class is used to define locality in the DIT.

```
locality  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MAY CONTAIN     { description |
                          searchGuide |
                          LocaleAttributeSet |
                          seeAlso }
        ID              id-oc-locality }
```

At least one of Locality Name or State or Province Name shall be present.

6.3 Organization

The *Organization* object class is used to define organization entries in the DIT.

```
organization  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { organizationName }
        MAY CONTAIN     { OrganizationalAttributeSet }
        ID              id-oc-organization }
```

6.4 Organizational Unit

The *Organizational Unit* object class is used to define entries representing subdivisions of organizations.

```
organizationalUnit  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { organizationalUnitName }
        MAY CONTAIN     { OrganizationalAttributeSet }
        ID              id-oc-organizationalUnit }
```

6.5 Person

The *Person* object class is used to define entries representing people generically.

```
person  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName | surname }
        MAY CONTAIN     { description |
                          telephoneNumber |
                          userPassword |
                          seeAlso }
        ID              id-oc-person }
```

6.6 Organizational Person

The *Organizational Person* object class is used to define entries representing people employed by, or in some other important way associated with, an organization.

```
organizationalPerson  OBJECT-CLASS  ::= {
        SUBCLASS OF     { person }
        MAY CONTAIN     { LocaleAttributeSet |
                          PostalAttributeSet |
                          TelecommunicationAttributeSet |
                          organizationalUnitName |
                          title }
        ID              id-oc-organizationalPerson }
```

6.7 Organizational Role

The *Organizational Role* object class is used to define entries representing an organizational role, i.e., a position or role within an organization. An organizational role is normally considered to be filled by a particular organizational person. Over its lifetime, however, an organizational role may be filled by a number of different organizational people in succession. In general, an organizational role may be filled by a person or a non-human entity.

```
organizationalRole  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName }
        MAY CONTAIN     { description |
                          LocaleAttributeSet |
                          organizationalUnitName |
                          PostalAttributeSet |
                          preferredDeliveryMethod |
                          roleOccupant |
                          seeAlso |
                          TelecommunicationAttributeSet }
        ID              id-oc-organizationalRole }
```

6.8 Group of Names

The *Group Of Names* object class is used to define entries representing an unordered set of names which represent individual objects or other groups of names. The membership of a group is static, i.e., it is explicitly modified by administrative action, rather than dynamically determined each time the group is referred to.

The membership of a group can be reduced to a set of individual object's names by replacing each group with its membership. This process could be carried out recursively until all constituent group names have been eliminated, and only the names of individual objects remain.

```
groupOfNames  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName | member }
        MAY CONTAIN     { description |
                          organizationName |
                          organizationalUnitName |
                          owner |
                          seeAlso |
                          businessCategory }
        ID              id-oc-groupOfNames }
```

6.9 Group of Unique Names

The *Group Of Unique Names* object class is used to define entries representing an unordered set of names whose integrity can be assured and which represent individual objects or other groups of names. The membership of a group is static, i.e., it is explicitly modified by administrative action, rather than dynamically determined each time the group is referred to.

```
groupOfUniqueNames  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName | uniqueMember }
        MAY CONTAIN     { description |
                          organizationName |
                          organizationalUnitName |
                          owner |
                          seeAlso |
                          businessCategory }
        ID              id-oc-groupOfUniqueNames }
```

6.10 Residential Person

The *Residential Person* object class is used to define entries representing a person in the residential environment.

```
residentialPerson  OBJECT-CLASS  ::= {
        SUBCLASS OF     { person }
        MUST CONTAIN    { localityName }
```

```
        MAY CONTAIN     { LocaleAttributeSet |
                          PostalAttributeSet |
                          preferredDeliveryMethod |
                          TelecommunicationAttributeSet |
                          businessCategory }
        ID              id-oc-residentialPerson }
```

6.11 Application Process

The *Application Process* object class is used to define entries representing application processes. An application process is an element within a real open-system which performs the information processing for a particular application (see ITU-T Rec. X.200 | ISO/IEC 7498-1).

```
applicationProcess  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName }
        MAY CONTAIN     { description |
                          localityName |
                          organizationalUnitName |
                          seeAlso }
        ID              id-oc-applicationProcess }
```

6.12 Application Entity

The *Application Entity* object class is used to define entries representing application entities. An application entity consists of those aspects of an application process pertinent to OSI.

```
applicationEntity  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName | presentationAddress }
        MAY CONTAIN     { description |
                          localityName |
                          organizationName |
                          organizationalUnitName |
                          seeAlso |
                          supportedApplicationContext }
        ID              id-oc-applicationEntity }
```

NOTE – If an application-entity is represented as a Directory object that is distinct from an application process, the **commonName** attribute is used to carry the value of the Application Entity Qualifier.

6.13 DSA

The *DSA* object class is used to define entries representing DSAs. A DSA is as defined in ITU-T Rec. X.501 | ISO/IEC 9594-2.

```
dSA  OBJECT-CLASS  ::= {
        SUBCLASS OF     { applicationEntity }
        MAY CONTAIN     { knowledgeInformation }
        ID              id-oc-dSA }
```

6.14 Device

The *Device* object class is used to define entries representing devices. A device is a physical unit which can communicate, such as a modem, disk drive, etc.

```
device  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName }
        MAY CONTAIN     { description |
                          localityName |
                          organizationName |
                          organizationalUnitName |
                          owner |
                          seeAlso |
                          serialNumber }
        ID              id-oc-device }
```

NOTE – At least one of **localityName**, **serialNumber**, **owner**, should be included. The choice is dependent on device type.

6.15 Strong Authentication User

The *Strong Authentication User* object class is used to define entries for objects which participate in strong authentication, as defined in ITU-T Rec. X.509 | ISO/IEC 9594-8.

```
strongAuthenticationUser OBJECT-CLASS ::= {
    SUBCLASS OF    { top }
    KIND           auxiliary
    MUST CONTAIN   { userCertificate }
    ID             id-oc-strongAuthenticationUser }
```

NOTE – Use of this object class has been deprecated in favour of the **pkiUser** and **pkiCA** object classes defined in ITU-T Rec. X.509 | ISO/IEC 9594-8. Implementations that use **strongAuthenticationUser**, **certificationAuthority** and **certificationAuthorityv2** object classes are still conformant to the standard, although new implementations are strongly recommended to move to the **pkiUser** and **pkiCA** object classes.

6.16 User Security Information

The *User Security Information* object class is used to define entries for objects which need to indicate security information associated with them as defined in ITU-T Rec. X.509 | ISO/IEC 9594-8.

```
userSecurityInformation OBJECT-CLASS ::= {
    SUBCLASS OF    { top }
    KIND           auxiliary
    MAY CONTAIN    { supportedAlgorithms }
    ID             id-oc-userSecurityInformation }
```

6.17 Certification Authority

The *Certification Authority* object class is used to define entries for objects which act as certification authorities, as defined in ITU-T Rec. X.509 | ISO/IEC 9594-8.

```
certificationAuthority OBJECT-CLASS ::= {
    SUBCLASS OF    { top }
    KIND           auxiliary
    MUST CONTAIN   { cACertificate |
                   certificateRevocationList |
                   authorityRevocationList }
    MAY CONTAIN    { crossCertificatePair }
    ID             id-oc-certificationAuthority }
```

NOTE – Use of this object class has been deprecated in favour of the **pkiUser** and **pkiCA** object classes defined in ITU-T Rec. X.509 | ISO/IEC 9594-8. Implementations that use **strongAuthenticationUser**, **certificationAuthority** and **certificationAuthorityv2** object classes are still conformant to the standard, although new implementations are strongly recommended to move to the **pkiUser** and **pkiCA** object classes.

6.18 Certification Authority-V2

The *Certification Authority-V2* object class is used to define entries for objects which act as certification authorities and can support the delta revocation list as defined in ITU-T Rec. X.509 | ISO/IEC 9594-8.

```
certificationAuthority-V2 OBJECT-CLASS ::= {
    SUBCLASS OF    { certificationAuthority }
    KIND           auxiliary
    MAY CONTAIN    { deltaRevocationList }
    ID             id-oc-certificationAuthority-V2 }
```

NOTE – Use of this object class has been deprecated in favour of the **pkiUser** and **pkiCA** object classes defined in ITU-T Rec. X.509 | ISO/IEC 9594-8. Implementations that use **strongAuthenticationUser**, **certificationAuthority** and **certificationAuthorityv2** object classes are still conformant to the standard, although new implementations are strongly recommended to move to the **pkiUser** and **pkiCA** object classes.

6.19 DMD

The *DMD* object class is used to define DMD entries in the DIT.

```
dMD OBJECT-CLASS ::= {
    SUBCLASS OF    { top }
    MUST CONTAIN   { dmdName }
    MAY CONTAIN    { OrganizationalAttributeSet }
    ID             id-oc-dmd }
```

SECTION 3 – SELECTED NAME FORMS

7 Definition of selected name forms

7.1 Country name form

The *Country* name form specifies how entries of object class **country** may be named.

```
countryNameForm  NAME-FORM  ::= {
        NAMES                   country
        WITH ATTRIBUTES         { countryName }
        ID                      id-nf-countryNameForm }
```

7.2 Locality name form

The *Locality* name form specifies how entries of object class **locality** may be named.

```
locNameForm  NAME-FORM  ::= {
        NAMES                   locality
        WITH ATTRIBUTES         { localityName }
        ID                      id-nf-locNameForm }
```

7.3 State or Province name form

The *State or Province* name form specifies how entries of object class **locality** may be named.

```
sOPNameForm  NAME-FORM  ::= {
        NAMES                   locality
        WITH ATTRIBUTES         { stateOrProvinceName }
        ID                      id-nf-sOPNameForm }
```

7.4 Organization name form

The *Organization* name form specifies how entries of object class **organization** may be named.

```
orgNameForm  NAME-FORM  ::= {
        NAMES                   organization
        WITH ATTRIBUTES         { organizationName }
        ID                      id-nf-orgNameForm }
```

7.5 Organizational Unit name form

The *Organizational Unit* name form specifies how entries of object class **organizationalUnit** may be named.

```
orgUnitNameForm  NAME-FORM  ::= {
        NAMES                   organizationalUnit
        WITH ATTRIBUTES         { organizationalUnitName }
        ID                      id-nf-orgUnitNameForm }
```

7.6 Person name form

The *Person* name form specifies how entries of object class **person** may be named.

```
personNameForm  NAME-FORM  ::= {
        NAMES                   person
        WITH ATTRIBUTES         { commonName }
        ID                      id-nf-personNameForm }
```

7.7 Organizational Person name form

The *Organizational Person* name form specifies how entries of object class **organizationalPerson** may be named.

```
orgPersonNameForm  NAME-FORM  ::= {
        NAMES                   organizationalPerson
```

```
        WITH ATTRIBUTES     { commonName }
        AND OPTIONALLY      { organizationalUnitName }
        ID                  id-nf-orgPersonNameForm }
```

7.8 Organizational Role name form

The *Organizational Role* name form specifies how entries of object class **organizationalRole** may be named.

```
orgRoleNameForm  NAME-FORM  ::= {
        NAMES               organizationalRole
        WITH ATTRIBUTES     { commonName }
        ID                  id-nf-orgRoleNameForm }
```

7.9 Group of Names name form

The *Group of Names* name form specifies how entries of object class **groupOfNames** may be named.

```
gONNameForm  NAME-FORM  ::= {
        NAMES               groupOfNames
        WITH ATTRIBUTES     { commonName }
        ID                  id-nf-gONNameForm }
```

7.10 Residential Person name form

The *Residential Person* name form specifies how entries of object class **residentialPerson** may be named.

```
resPersonNameForm  NAME-FORM  ::= {
        NAMES               residentialPerson
        WITH ATTRIBUTES     { commonName }
        AND OPTIONALLY      { streetAddress }
        ID                  id-nf-resPersonNameForm }
```

7.11 Application Process name form

The *Application Process* name form specifies how entries of object class **applicationProcess** may be named.

```
applProcessNameForm  NAME-FORM  ::= {
        NAMES               applicationProcess
        WITH ATTRIBUTES     { commonName }
        ID                  id-nf-applProcessNameForm }
```

7.12 Application Entity name form

The *Application Entity* name form specifies how entries of object class **applicationEntity** may be named.

```
applEntityNameForm  NAME-FORM  ::= {
        NAMES               applicationEntity
        WITH ATTRIBUTES     { commonName }
        ID                  id-nf-applEntityNameForm }
```

7.13 DSA name form

The *DSA* name form specifies how entries of object class **dSA** may be named.

```
dSANameForm  NAME-FORM  ::= {
        NAMES               dSA
        WITH ATTRIBUTES     { commonName }
        ID                  id-nf-dSANameForm }
```

7.14 Device name form

The *Device* name form specifies how entries of object class **device** may be named.

```
deviceNameForm  NAME-FORM  ::= {
        NAMES                   device
        WITH ATTRIBUTES         { commonName }
        ID                      id-nf-deviceNameForm }
```

7.15 DMD name form

The *DMD* name form specifies how entries of object class **dMD** may be named.

```
dMDNameForm  NAME-FORM  ::= {
        NAMES                   dMD
        WITH ATTRIBUTES         { dmdName }
        ID                      id-nf-dMDNameForm }
```

Annex A

Selected object classes and name forms in ASN.1

(This annex forms an integral part of this Recommendation | International Standard)

This annex includes all of the ASN.1 type and value definitions contained in this Directory Specification in the form of the ASN.1 module **SelectedObjectClasses**.

```
SelectedObjectClasses {joint-iso-itu-t ds(5) module(1) selectedObjectClasses(6) 5}
DEFINITIONS ::=
BEGIN

-- EXPORTS All --
-- The types and values defined in this module are exported for use in the other ASN.1 modules contained
-- within the Directory Specifications, and for the use of other applications which will use them to access
-- Directory services. Other applications may use them for their own purposes, but this will not constrain
-- extensions and modifications needed to maintain or improve the Directory service.

IMPORTS

        authenticationFramework, certificateExtensions, id-nf, id-oc,informationFramework,
        objectClass, selectedAttributeTypes
                FROM  UsefulDefinitions {joint-iso-itu-t ds(5) module(1) usefulDefinitions(0) 5}

        alias, ATTRIBUTE, NAME-FORM, OBJECT-CLASS, top
                FROM  InformationFramework informationFramework

        businessCategory, commonName, countryName, description, destinationIndicator, dmdName,
        facsimileTelephoneNumber, internationalISDNNumber, knowledgeInformation, localityName,
        member, organizationalUnitName, organizationName, owner, physicalDeliveryOfficeName,
        postalAddress, postalCode, postOfficeBox, preferredDeliveryMethod, presentationAddress,
        registeredAddress, roleOccupant, searchGuide, seeAlso, serialNumber, stateOrProvinceName,
        streetAddress, supportedApplicationContext, surname, telephoneNumber,
        telexNumber, title, uniqueMember, x121Address
                FROM SelectedAttributeTypes selectedAttributeTypes

        authorityRevocationList, cACertificate, certificateRevocationList, crossCertificatePair,
        deltaRevocationList, supportedAlgorithms, userCertificate, userPassword
                FROM AuthenticationFramework authenticationFramework        ;

-- Attribute sets --

TelecommunicationAttributeSet ATTRIBUTE  ::= {
        facsimileTelephoneNumber |
        internationalISDNNumber |
        telephoneNumber |
--      teletexTerminalIdentifier |         Attribute type has been deleted
        telexNumber |
        preferredDeliveryMethod |
        destinationIndicator |
        registeredAddress |
        x121Address }

PostalAttributeSet  ATTRIBUTE  ::= {
        physicalDeliveryOfficeName |
        postalAddress |
        postalCode |
        postOfficeBox |
        streetAddress }

LocaleAttributeSet  ATTRIBUTE  ::= {
        localityName |
        stateOrProvinceName |
        streetAddress }
```

```
OrganizationalAttributeSet ATTRIBUTE ::= {
        description |
        LocaleAttributeSet |
        PostalAttributeSet |
        TelecommunicationAttributeSet |
        businessCategory |
        seeAlso |
        searchGuide |
        userPassword }

-- Object classes --

country OBJECT-CLASS ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { countryName }
        MAY CONTAIN     { description | searchGuide }
        ID              id-oc-country }

locality OBJECT-CLASS ::= {
        SUBCLASS OF     { top }
        MAY CONTAIN     { description |
                          searchGuide |
                          LocaleAttributeSet |
                          seeAlso }
        ID              id-oc-locality }

organization OBJECT-CLASS ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { organizationName }
        MAY CONTAIN     { OrganizationalAttributeSet }
        ID              id-oc-organization }

organizationalUnit OBJECT-CLASS ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { organizationalUnitName }
        MAY CONTAIN     { OrganizationalAttributeSet }
        ID              id-oc-organizationalUnit }

person OBJECT-CLASS ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName | surname }
        MAY CONTAIN     { description |
                          telephoneNumber |
                          userPassword |
                          seeAlso }
        ID              id-oc-person }

organizationalPerson OBJECT-CLASS ::= {
        SUBCLASS OF     { person }
        MAY CONTAIN     { LocaleAttributeSet |
                          PostalAttributeSet |
                          TelecommunicationAttributeSet |
                          organizationalUnitName |
                          title }
        ID              id-oc-organizationalPerson }

organizationalRole OBJECT-CLASS ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName }
        MAY CONTAIN     { description |
                          LocaleAttributeSet |
                          organizationalUnitName |
                          PostalAttributeSet |
                          preferredDeliveryMethod |
                          roleOccupant |
                          seeAlso |
                          TelecommunicationAttributeSet }
        ID              id-oc-organizationalRole }
```

```
groupOfNames  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName | member }
        MAY CONTAIN     { description |
                          organizationName |
                          organizationalUnitName |
                          owner |
                          seeAlso |
                          businessCategory }
        ID              id-oc-groupOfNames }

groupOfUniqueNames  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName | uniqueMember }
        MAY CONTAIN     { description |
                          organizationName |
                          organizationalUnitName |
                          owner |
                          seeAlso |
                          businessCategory }
        ID              id-oc-groupOfUniqueNames }

residentialPerson  OBJECT-CLASS  ::= {
        SUBCLASS OF     { person }
        MUST CONTAIN    { localityName }
        MAY CONTAIN     { LocaleAttributeSet |
                          PostalAttributeSet |
                          preferredDeliveryMethod |
                          TelecommunicationAttributeSet |
                          businessCategory }
        ID              id-oc-residentialPerson }

applicationProcess  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName }
        MAY CONTAIN     { description |
                          localityName |
                          organizationalUnitName |
                          seeAlso }
        ID              id-oc-applicationProcess }

applicationEntity  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName | presentationAddress }
        MAY CONTAIN     { description |
                          localityName |
                          organizationName |
                          organizationalUnitName |
                          seeAlso |
                          supportedApplicationContext }
        ID              id-oc-applicationEntity }

dSA  OBJECT-CLASS  ::= {
        SUBCLASS OF     { applicationEntity }
        MAY CONTAIN     { knowledgeInformation }
        ID              id-oc-dSA }

device  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { commonName }
        MAY CONTAIN     { description |
                          localityName |
                          organizationName |
                          organizationalUnitName |
                          owner |
                          seeAlso |
                          serialNumber }
        ID              id-oc-device }
```

```
strongAuthenticationUser OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        KIND            auxiliary
        MUST CONTAIN    { userCertificate }
        ID              id-oc-strongAuthenticationUser }

userSecurityInformation  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        KIND            auxiliary
        MAY CONTAIN     { supportedAlgorithms }
        ID              id-oc-userSecurityInformation }

certificationAuthority  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        KIND            auxiliary
        MUST CONTAIN    { cACertificate |
                        certificateRevocationList |
                        authorityRevocationList }
        MAY CONTAIN     { crossCertificatePair }
        ID              id-oc-certificationAuthority }

certificationAuthority-V2  OBJECT-CLASS  ::= {
        SUBCLASS OF     { certificationAuthority }
        KIND            auxiliary
        MAY CONTAIN     { deltaRevocationList }
        ID              id-oc-certificationAuthority-V2 }

dMD  OBJECT-CLASS  ::= {
        SUBCLASS OF     { top }
        MUST CONTAIN    { dmdName }
        MAY CONTAIN     { OrganizationalAttributeSet }
        ID              id-oc-dmd }

-- Name forms --

countryNameForm  NAME-FORM  ::= {
        NAMES                   country
        WITH ATTRIBUTES         { countryName }
        ID                      id-nf-countryNameForm }

locNameForm  NAME-FORM  ::= {
        NAMES                   locality
        WITH ATTRIBUTES         { localityName }
        ID                      id-nf-locNameForm }

sOPNameForm  NAME-FORM  ::= {
        NAMES                   locality
        WITH ATTRIBUTES         { stateOrProvinceName }
        ID                      id-nf-sOPNameForm }

orgNameForm  NAME-FORM  ::= {
        NAMES                   organization
        WITH ATTRIBUTES         { organizationName }
        ID                      id-nf-orgNameForm }

orgUnitNameForm  NAME-FORM  ::= {
        NAMES                   organizationalUnit
        WITH ATTRIBUTES         { organizationalUnitName }
        ID                      id-nf-orgUnitNameForm }

personNameForm  NAME-FORM  ::= {
        NAMES                   person
        WITH ATTRIBUTES         { commonName }
        ID                      id-nf-personNameForm }

orgPersonNameForm  NAME-FORM  ::= {
        NAMES                   organizationalPerson
        WITH ATTRIBUTES         { commonName }
        AND OPTIONALLY          { organizationalUnitName }
        ID                      id-nf-orgPersonNameForm }
```

```
orgRoleNameForm  NAME-FORM  ::= {
        NAMES                   organizationalRole
        WITH ATTRIBUTES         { commonName }
        ID                      id-nf-orgRoleNameForm }

gONNameForm  NAME-FORM  ::= {
        NAMES                   groupOfNames
        WITH ATTRIBUTES         { commonName }
        ID                      id-nf-gONNameForm }

resPersonNameForm  NAME-FORM  ::= {
        NAMES                   residentialPerson
        WITH ATTRIBUTES         { commonName }
        AND OPTIONALLY          { streetAddress }
        ID                      id-nf-resPersonNameForm }

applProcessNameForm  NAME-FORM  ::= {
        NAMES                   applicationProcess
        WITH ATTRIBUTES         { commonName }
        ID                      id-nf-applProcessNameForm }

applEntityNameForm  NAME-FORM  ::= {
        NAMES                   applicationEntity
        WITH ATTRIBUTES         { commonName }
        ID                      id-nf-applEntityNameForm }

dSANameForm  NAME-FORM  ::= {
        NAMES                   dSA
        WITH ATTRIBUTES         { commonName }
        ID                      id-nf-dSANameForm }

deviceNameForm  NAME-FORM  ::= {
        NAMES                   device
        WITH ATTRIBUTES         { commonName }
        ID                      id-nf-deviceNameForm }

dMDNameForm  NAME-FORM  ::= {
        NAMES                   dMD
        WITH ATTRIBUTES         { dmdName }
        ID                      id-nf-dMDNameForm }

-- Object identifier assignments --
-- object identifiers assigned in other modules are shown in comments

-- Object classes --

-- id-oc-top                    OBJECT IDENTIFIER   ::=  {id-oc 0}     Defined in ITU-T Rec. X.501 |
--                                                                     ISO/IEC 9594-2
-- id-oc-alias                  OBJECT IDENTIFIER   ::=  {id-oc 1}     Defined in ITU-T Rec. X.501 |
--                                                                     ISO/IEC 9594-2
id-oc-country                   OBJECT IDENTIFIER   ::=  {id-oc 2}
id-oc-locality                  OBJECT IDENTIFIER   ::=  {id-oc 3}
id-oc-organization              OBJECT IDENTIFIER   ::=  {id-oc 4}
id-oc-organizationalUnit        OBJECT IDENTIFIER   ::=  {id-oc 5}
id-oc-person                    OBJECT IDENTIFIER   ::=  {id-oc 6}
id-oc-organizationalPerson      OBJECT IDENTIFIER   ::=  {id-oc 7}
id-oc-organizationalRole        OBJECT IDENTIFIER   ::=  {id-oc 8}
id-oc-groupOfNames              OBJECT IDENTIFIER   ::=  {id-oc 9}
id-oc-residentialPerson         OBJECT IDENTIFIER   ::=  {id-oc 10}
id-oc-applicationProcess        OBJECT IDENTIFIER   ::=  {id-oc 11}
id-oc-applicationEntity         OBJECT IDENTIFIER   ::=  {id-oc 12}
id-oc-dSA                       OBJECT IDENTIFIER   ::=  {id-oc 13}
id-oc-device                    OBJECT IDENTIFIER   ::=  {id-oc 14}
id-oc-strongAuthenticationUser  OBJECT IDENTIFIER   ::=  {id-oc 15}    -- Deprecated, see 6.15
id-oc-certificationAuthority    OBJECT IDENTIFIER   ::=  {id-oc 16}    -- Deprecated, see 6.17
id-oc-certificationAuthority-V2 OBJECT IDENTIFIER   ::=  {id-oc 16 2}  -- Deprecated, see 6.18
id-oc-groupOfUniqueNames        OBJECT IDENTIFIER   ::=  {id-oc 17}
```

```
id-oc-userSecurityInformation       OBJECT IDENTIFIER  ::=  {id-oc 18}
-- id-oc-cRLDistributionPoint       OBJECT IDENTIFIER  ::=  {id-oc 19}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
id-oc-dmd                           OBJECT IDENTIFIER  ::=  {id-oc 20}
-- id-oc-pkiUser                    OBJECT IDENTIFIER  ::=  {id-oc 21}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
-- id-oc-pkiCA                      OBJECT IDENTIFIER  ::=  {id-oc 22}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
-- id-oc-deltaCRL                   OBJECT IDENTIFIER  ::=  {id-oc 23}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
-- id-oc-pmiUser                    OBJECT IDENTIFIER  ::=  {id-oc 24}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
-- id-oc-pmiAA                      OBJECT IDENTIFIER  ::=  {id-oc 25}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
-- id-oc-pmiSOA                     OBJECT IDENTIFIER  ::=  {id-oc 26}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
-- id-oc-attCertCRLDistributionPts  OBJECT IDENTIFIER  ::=  {id-oc 27}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
-- id-oc-parent                     OBJECT IDENTIFIER  ::=  {id-oc 28}   Defined in ITU-T Rec. X.501 |
--                                                                       ISO/IEC 9594-2
-- id-oc-child                      OBJECT IDENTIFIER  ::=  {id-oc 29}   Defined in ITU-T Rec. X.501 |
--                                                                       ISO/IEC 9594-2
-- id-oc-cpCps                      OBJECT IDENTIFIER  ::=  {id-oc 30}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
-- id-oc-pkiCertPath                OBJECT IDENTIFIER  ::=  {id-oc 31}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
-- id-oc-privilegePolicy            OBJECT IDENTIFIER  ::=  {id-oc 32}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
-- id-oc-pmiDelegationPath          OBJECT IDENTIFIER  ::=  {id-oc 33}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8
-- id-oc-protectedPrivilegePolicy   OBJECT IDENTIFIER  ::=  {id-oc-34}   Defined in ITU-T Rec. X.509 |
--                                                                       ISO/IEC 9594-8

--  Name forms --

id-nf-countryNameForm               OBJECT IDENTIFIER  ::=  {id-nf 0}
id-nf-locNameForm                   OBJECT IDENTIFIER  ::=  {id-nf 1}
id-nf-sOPNameForm                   OBJECT IDENTIFIER  ::=  {id-nf 2}
id-nf-orgNameForm                   OBJECT IDENTIFIER  ::=  {id-nf 3}
id-nf-orgUnitNameForm               OBJECT IDENTIFIER  ::=  {id-nf 4}
id-nf-personNameForm                OBJECT IDENTIFIER  ::=  {id-nf 5}
id-nf-orgPersonNameForm             OBJECT IDENTIFIER  ::=  {id-nf 6}
id-nf-orgRoleNameForm               OBJECT IDENTIFIER  ::=  {id-nf 7}
id-nf-gONNameForm                   OBJECT IDENTIFIER  ::=  {id-nf 8}
id-nf-resPersonNameForm             OBJECT IDENTIFIER  ::=  {id-nf 9}
id-nf-applProcessNameForm           OBJECT IDENTIFIER  ::=  {id-nf 10}
id-nf-applEntityNameForm            OBJECT IDENTIFIER  ::=  {id-nf 11}
id-nf-dSANameForm                   OBJECT IDENTIFIER  ::=  {id-nf 12}
id-nf-deviceNameForm                OBJECT IDENTIFIER  ::=  {id-nf 13}
-- id-nf-cRLDistPtNameForm          OBJECT IDENTIFIER  ::=  {id-nf 14}
id-nf-dMDNameForm                   OBJECT IDENTIFIER  ::=  {id-nf 15}
-- id-nf-subentryNameForm           OBJECT IDENTIFIER  ::=  {id-nf 16}

END  -- SelectedObjectClasses
```

Annex B

Suggested name forms and DIT structures

(This annex does not form an integral part of this Recommendation | International Standard)

This annex suggests a DIT structure shown in Figure B.1 and related DIT structure rules using the name forms defined in clause 3. The rules cover an unconstrained DIT structure. This example is for illustrative purposes only, and is not intended to limit the types of names that can be validly constructed in the Directory.

The integer identifiers assigned in this annex and used in Figure B.1 are arbitrary and have no global (or standardized) significance. A particular structure rule identifier only has significance within the scope of the subschema in which it applied. Each DMD is responsible for creating its own DIT structure and structure rules that may differ from this example.

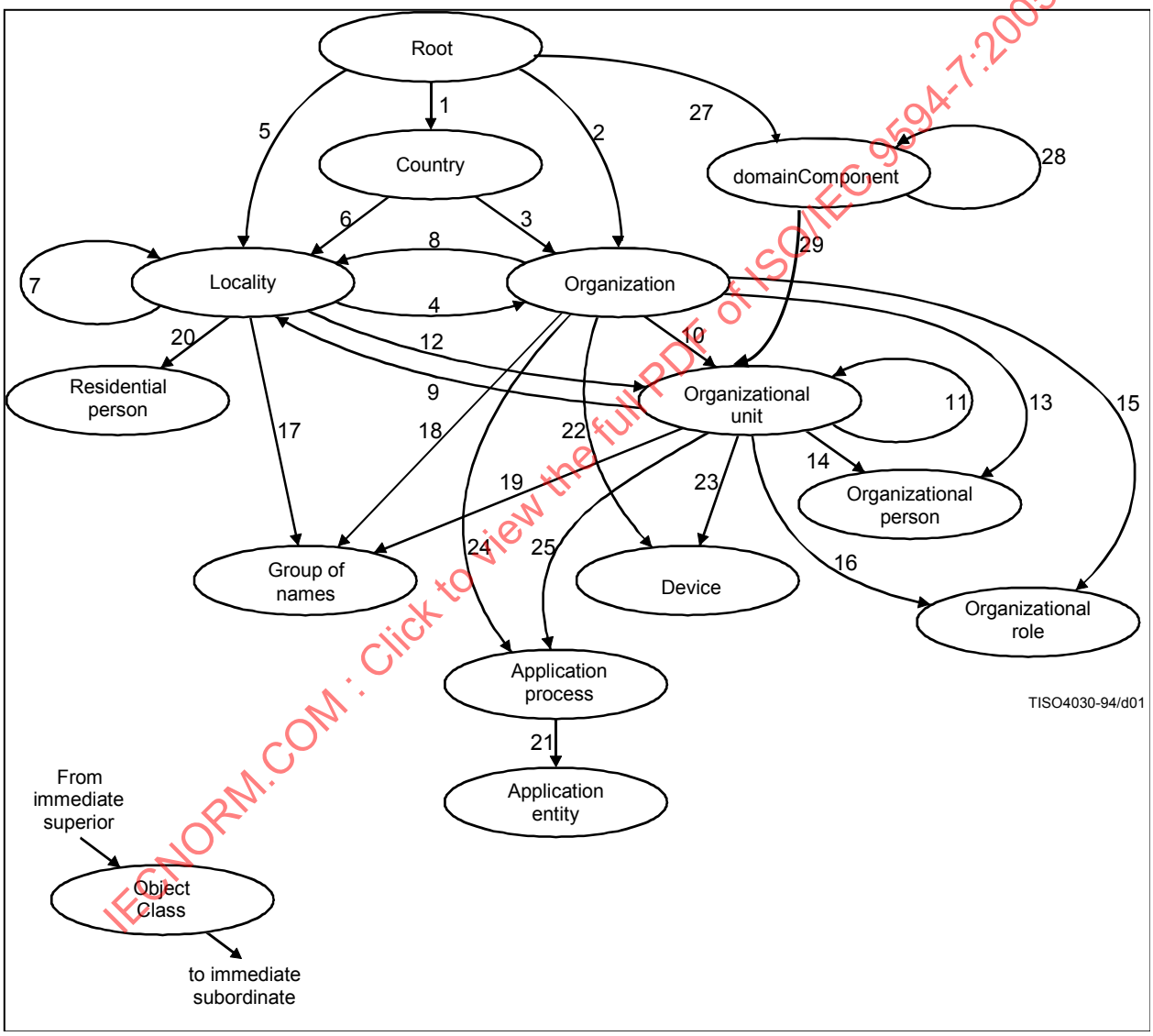

Figure B.1 – Example DIT structure