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Information technology — Open Systems Interconnection — Procedures for the operation of OSI Registration Authorities: General procedures and top arcs of the International Object Identifier tree

Technologies de l'information — Interconnexion de systèmes ouverts (OSI) — Procédures opérationnelles pour les organismes d'enregistrement de l'OSI: Procédures générales et arcs sommitaux de l'arborescence des identificateurs d'objet internationale

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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.

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 9834-1:2009 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.660 (08/2008).

This third edition cancels and replaces the second edition (ISO/IEC 9834-1:2005), which has been technically revised.

ISO/IEC 9834 consists of the following parts, under the general title *Information technology — Open Systems Interconnection — Procedures for the operation of OSI Registration Authorities:*

— *Part 1: General procedures and top arcs of the International Object Identifier tree*

— *Part 2: Registration procedures for OSI document types*

— *Part 3: Registration of Object Identifier arcs beneath the top-level arc jointly administered by ISO and ITU-T*

— *Part 4: Register of VTE Profiles*

— *Part 5: Register of VT Control Object Definitions*

— *Part 6: Registration of application processes and application entities*

— *Part 7: Joint ISO and ITU-T Registration of International Organizations*

— *Part 8: Generation and registration of Universally Unique Identifiers (UUIDs) and their use as ASN.1 Object Identifier components*

— *Part 9: Registration of object identifier arcs for applications and services using tag-based identification*

INTERNATIONAL STANDARD
ITU-T RECOMMENDATION

Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities: General procedures and top arcs of the International Object Identifier tree

1 Scope

This Recommendation | International Standard:

a) specifies a registration-hierarchical-name-tree (RH-name-tree) which is a generic tree structure for allocations made by a hierarchical structure of Registration Authorities, and the specific form of this that supports the ASN.1 `OBJECT IDENTIFIER` type and the ASN.1 `OID-IRI` type (see ITU-T Rec. X.680 | ISO/IEC 8824-1);

b) registers top-level arcs of the international object identifier tree;

c) specifies procedures which are generally applicable to registration in the context of any RH-name-tree;

d) provides guidelines for the establishment and operation of International Registration Authorities for use, when needed, by other Recommendations and/or International Standards;

e) provides guidelines for additional Recommendations | International Standards which choose to reference the procedures in this Recommendation | International Standard;

f) provides a recommended fee structure for lower-level Registration Authorities;

g) records the information provided to IETF and the registration with IANA of the "oid" IRI scheme (see Annex F).

NOTE 1 – This Recommendation | International Standard does not exclude or disallow the use of any syntactic form of names or naming domains for registration purposes. This Recommendation | International Standard is intended to cover those cases where a registration-hierarchical-name is an appropriate form of identification.

NOTE 2 – Information about registration for specific objects is contained in separate Recommendations | International Standards.

This Recommendation | International Standard applies to registration by Recommendations and/or International Standards, by International Registration Authorities (see clause 8), and by any other Registration Authority.

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 edition 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.207 (1993) | ISO/IEC 9545:1994, *Information technology – Open Systems Interconnection – Application layer structure*.

– ITU-T Recommendation X.500 (2008) | ISO/IEC 9594-1:2008, *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.520 (2005) | ISO/IEC 9594-6:2005, *Information technology – Open Systems Interconnection – The Directory: Selected attribute types.*

– ITU-T Recommendation X.650 (1996) | ISO/IEC 7498-3:1997, *Information technology – Open Systems Interconnection – Basic Reference Model: Naming and addressing.*

- ITU-T Recommendation X.662 (2008) | ISO/IEC 9834-3:2008, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities: Registration of object identifier arcs beneath the top-level arc jointly administered by ISO and ITU-T.*
- ITU-T Recommendation X.680 (2008) | ISO/IEC 8824-1:2008, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*
- ITU-T Recommendation X.681 (2008) | ISO/IEC 8824-2:2008, *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification*.
- ITU-T Recommendation X.690 (2008) | ISO/IEC 8825-1:2008, *Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER), and Distinguished Encoding Rules (DER).*
- ITU-T Recommendation X.722 (1992) | ISO/IEC 10165-4:1992, *Information technology – Open Systems Interconnection – Structure of management information: Guidelines for the definition of managed objects.*

2.2 Paired Recommendations | International Standards equivalent in technical content

- ITU-T Recommendation F.400/X.400 (1999), *Message handling system and service overview*.

  ISO/IEC 10021-1:2003, *Information technology – Message Handling Systems (MHS) – Part 1: System and service overview*.

2.3 Additional references

- ITU-T Recommendation X.121 (2000), *International numbering plan for public data networks*.
- IETF RFC 3987 (2005), *Internationalized Resource Identifiers (IRIs)*.
- ISO 3166-1:2006, *Codes for the representation of names of countries and their subdivisions – Part 1: Country codes.*
- ISO 3166-3:1999, *Codes for the representation of names of countries and their subdivisions – Part 3: Codes for formerly used names of countries.*
- ISO/IEC 6523-1:1998, *Information technology – Structure for the identification of organizations and organization parts – Part 1: Identification of organization identification schemes.*
- ISO/IEC 6523-2:1998, *Information technology – Structure for the identification of organizations and organization parts – Part 2: Registration of organization identification schemes.*
- ISO 8571-1:1988, *Information processing system – Open Systems Interconnection – File transfer, Access and Management – Part 1: General introduction.*
- ISO/IEC 10646:2003, *Information technology – Universal Multiple-Octet Coded Character Set (UCS)*.

  NOTE – ITU-T Rec. T.55 [3] recommends the use of ISO/IEC 10646 for the representation of the languages of the world.
- W3C XML Namespaces:2006, *Namespaces in XML, W3C Recommendation, Copyright © [16 August 2006] World Wide Web Consortium, (Massachusetts Institute of Technology, Institut National de Recherche en Informatique et en Automatique, Keio University),* http://www.w3.org/TR/2006/REC-xml-names-20060816.

3 Definitions

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

3.1 Organization definition

This Recommendation | International Standard uses the following term defined in ISO/IEC 6523-1:

a) organization.

3.2 OSI reference model terms

This Recommendation | International Standard uses the following terms defined in ITU-T Rec. X.650 | ISO/IEC 7498-3:

a) name;

b) naming authority;

c) naming domain;

d) synonym.

3.3 Application layer structure terms

This Recommendation | International Standard uses the following terms defined in ITU-T Rec. X.207 | ISO/IEC 9545:

a) application-entity-title;

b) application-process-title.

3.4 ASN.1 terms

3.4.1 This Recommendation | International Standard uses the following terms defined in ITU-T Rec. X.680 | ISO/IEC 8824-1:

a) (ASN.1) identifier

b) object;

c) object descriptor type;

d) (ASN.1) object identifier type;

e) OID internationalized resource identifier type.

3.4.2 This Recommendation | International Standard uses the following term defined in ITU-T Rec. X.681 | ISO/IEC 8824-2:

a) information object.

3.5 Directory terms

3.5.1 This Recommendation | International Standard uses the following terms defined in ITU-T Rec. X.500 | ISO/IEC 9594-1:

a) Directory;

b) Directory name.

3.5.2 This Recommendation | International Standard uses the following terms defined in ITU-T Rec. X.501 | ISO/IEC 9594-2:

a) attribute;

b) attribute type;

c) attribute value;

d) attribute value assertion;

e) object class;

f) relative distinguished name.

3.6 Unicode terms

This Recommendation | International Standard uses the following terms defined in ISO/IEC 10646:

a) coded character;

b) graphics character.

3.7 Additional definitions

3.7.1 additional secondary identifier: A secondary identifier for a top-level arc of the international object identifier tree that is assigned from time to time by a simple Resolution of both the relevant ITU-T study group and the relevant ISO/IEC JTC 1 Sub-Committee, without requiring any change to this or any other Recommendation and/or International Standard (see A.6.4).

3.7.2 additional Unicode label: A Unicode label for one of the top-level arcs of the international object identifier tree that is assigned from time to time by a simple Resolution of both the relevant ITU-T study group and the relevant ISO/IEC JTC 1 Sub-Committee, without requiring any change to this or any other Recommendation | International Standard (see A.6.4).

3.7.3 administrative role (of a Registration Authority): Assigning and making available unambiguous names according to the Recommendation | International Standard defining the procedures for the Registration Authority (at whatever depth).

3.7.4 integer-valued Unicode label: A Unicode label for an arc that is the character representation (with no leading zeros) of the primary integer value of that arc.

NOTE – An arc of the international object identifier tree can have no other Unicode label that is the character representation (with or without leading zeros) of an integer value (see 7.2.4).

3.7.5 International Registration Authority: A Registration Authority (see 3.7.17) acting at the international level where the procedures for its operation, defined in a relevant Recommendation and/or International Standard, declare it to operate as an International Registration Authority (see clause 8).

3.7.6 International Object Identifier tree: A specific form of an RH-name-tree whose root corresponds to this Recommendation | International Standard and whose nodes correspond to registration authorities responsible for allocating arcs from a parent node.

3.7.7 IRI/URI value: A value that identifies a resource using one of the schemes registered with IANA for URIs.

3.7.8 Joint ITU-T | ISO/IEC JTC 1 Collaborative Team for object identifiers: A group established in accordance with ITU-T Rec. A.23, Annex A and ISO/IEC JTC 1 Directives Edition 5 Version 2.0, subclause 2.6.4 and Annex K, clause 8 to progress work on Joint Text in relation to object identifiers (OIDs).

3.7.9 long arc: A Unicode label from a superior node in the international object identifier tree that identifies a node that is not immediately beneath the superior node.

NOTE 1 – The long arc (in addition to normal arcs) has to satisfy the unambiguity requirements for all arcs from that superior node (see 7.2.8).

NOTE 2 – The only property of a long arc (see 3.7.15) is its Unicode label. It does not have a primary integer value or a secondary identifier. It is essentially a short-cut for a series of arcs, each of which has a primary integer value and its own Unicode labels.

NOTE 3 – The long arc can therefore not be used to define the value of an (ASN.1) object identifier type. It can only be used in an OID internationalized resource identifier (see 3.7.12).

3.7.10 object (of interest): Anything in some world, generally the world of telecommunications and information processing or some part thereof,

a) which is identifiable (can be named); and

b) which may be registered.

NOTE – Examples of objects are ASN.1 modules (see ITU-T Rec. X.680 | ISO/IEC 8824-1), information objects (see ITU-T Rec. X.681 | ISO/IEC 8824-2), managed objects (see ITU-T Rec. X.722 | ISO/IEC 10165-4), XML namespaces (see W3C XML Namespaces) and any other object that can be identified by an OID, URI or IRI.

3.7.11 object identifier: An ordered list of primary integer values from the root of the international object identifier tree to a node, which unambiguously identifies that node (see 7.2.8).

3.7.12 OID internationalized resource identifier: An IRI/URI value constrained to the IANA "oid" IRI/URI scheme (see Annex F)

NOTE 1 – This is semantically an ordered list of Unicode labels, from the root of the international object identifier tree, that unambiguously identifies the node for a resource (see 7.2.8)

NOTE 2 – The ASN.1 `OID-IRI` type (see ITU-T Rec. X.680 | ISO/IEC 8824-1) is the set of all OID international resource identifier values, and provides value notations for all OID international resource identifiers based on the international object identifier tree. Corresponding encodings are specified in the ITU-T Rec. X.690 series | ISO/IEC 8825 multipart Standard.

3.7.13 primary integer value: A primary value of type integer used to unambiguously identify an arc of the international object identifier tree.

NOTE – An arc of the international object identifier tree has precisely one primary integer value, apart from long arcs, that have only Unicode labels.

3.7.14 primary value: A value of a specified type assigned to an arc of the RH-name-tree that can provide an unambiguous identification of that arc within the set of arcs from its superior node.

3.7.15 properties of an arc: The primary integer value and the Unicode labels and secondary identifiers assigned to that arc.

NOTE – Long arcs (see 3.7.9) have only Unicode labels. All other arcs have precisely one primary integer value.

3.7.16 registration: The assignment of an unambiguous name to an object in a way which makes the assignment available to interested parties.

3.7.17 Registration Authority: An entity such as an organization, a standard or an automated facility that performs registration of one or more types of objects (see also 3.7.5).

NOTE – For this Recommendation | International Standard, the above definition of registration authority extends the term to cover registration by organizations acting at international, regional and national levels and by other means.

3.7.18 registration-hierarchical-name: A name which is unambiguous within the registration-hierarchical-name-tree and which is assigned by registration. The semantic form of this name is structured according to the rules in clause 6.

3.7.19 registration-hierarchical-name-tree: A tree whose nodes correspond to objects that are registered and whose non-leaf nodes may be registration authorities.

3.7.20 registration procedures: The specified procedures for performing registration and amending (or deleting) existing registrations.

3.7.21 relevant ITU-T study group: The ITU-T study group that is responsible for the Joint ITU-T | ISO/IEC JTC 1 Collaborative Team for object identifiers.

3.7.22 relevant ISO/IEC JTC 1 Sub-Committee: The ISO/IEC JTC 1 Sub-Committee that is responsible for the Joint ITU-T | ISO/IEC JTC 1 Collaborative Team for object identifiers.

3.7.23 root arc: One of the three arcs from the root of the international object identifier tree.

3.7.24 secondary identifier: A secondary value restricted to the characters forming an (ASN.1) identifier (see ITU-T Rec. X.680 | ISO/IEC 8824-1), assigned either in an ITU-T Recommendation, an International Standard or by some other Registration Authority to an arc of the OID tree.

NOTE – An arc of the international object identifier tree can have zero or more secondary identifiers.

3.7.25 secondary value: A value of some type associated with an arc that provides additional identification useful for human readers, but that does not in general unambiguously identify that arc, and is not normally included in computer communications.

3.7.26 sponsoring authority: An organization recognized to receive proposals for registration and to submit applications to an International Registration Authority as defined by a given Recommendation and/or International Standard (see 8.2 and 8.3).

3.7.27 technical role (of a registration authority): Verifying that these definitions are in accordance with the Recommendation and/or International Standard defining the form of the definition.

3.7.28 top-level arcs (top arcs): The subset of arcs of the international object identifier tree that are assigned identifiers in this Recommendation | International Standard (supplemented by references to the ITU-T Rec. X.660 series | ISO/IEC 9834 multipart Standards, or by a Resolution from time to time of both the relevant ITU-T study group and the relevant ISO/IEC JTC 1 Sub-committee).

3.7.29 Unicode character: A character from the Unicode character set.

3.7.30 Unicode character set: The set of coded characters specified in ISO/IEC 10646.

NOTE – This is the same character set as that defined by the Unicode Consortium in [4].

3.7.31 Unicode label: A primary value that consists of an unbounded sequence of Unicode characters that does not contain the `SPACE` character (see 7.2.5 for other restrictions) used to unambiguously identify an arc of the ASN.1 tree.

NOTE 1 – Unicode labels are always case sensitive for matching purposes and when determining unambiguity.

NOTE 2 – An arc of the international object identifier tree can have multiple Unicode labels.

NOTE 3 – Joint action by ITU-T and ISO/IEC can also allocate a Unicode label for a long arc that identifies a node which is two levels beneath the root (see A.7).

4 Abbreviations

For the purposes of this Recommendation | International Standard, the following abbreviations apply:

ACSE	Association Control Service Element
ASN.1	Abstract Syntax Notation One
DCC	Data Country Code
DIT	Directory Information Tree
DNIC	Data Network Identification Code
DSA	Directory System Agent
DUA	Directory User Agent
FTAM	File Transfer, Access and Management
IANA	Internet Assigned Numbers Authority
ICD	International Code Designator
IRI	Internationalized Resource Identifier
ISP	International Standardized Profile
MHS	Message Handling Systems
OID	Object Identifier
OID-IRI	OID Internationalized Resource Identifier
OSI	Open Systems Interconnection
RA	Registration Authority
RDN	Relative Distinguished Name
RH-name	Registration-Hierarchical-name
RH-name-tree	Registration-Hierarchical-name-tree
ROA	Recognized Operating Agency
TSB	Telecommunication Standardization Bureau
URI	Uniform Resource Identifier

5 Notation

5.1 Unicode characters are specified in two ways. For a single character, it is normal to use the Unicode name in a special font followed by the word "character". For example:

SPACE character

5.2 For a range of characters, it is normal to use the letter U followed by eight hex digits for the start and end of the range (both in a special font) in accordance with the notation defined in ISO/IEC 10646. For example:

U0000F900 to **U0000FDCF**

6 Registration

6.1 Overview

6.1.1 Many Recommendations | International Standards define certain objects for which unambiguous identification is required. This is achieved by registration.

NOTE – Examples of these objects are given in 3.7.10.

6.1.2 Registration is the assignment of a name to an object in a way which makes the assignment available to interested parties. It is carried out by a registration authority.

6.1.3 Registration can be effected by a Recommendation | International Standard, by publishing in the Recommendation | International Standard the names and the corresponding definitions of object. Such a mechanism requires amendment of the Recommendation | International Standard for each registration, and hence is not appropriate in cases where the registration activity is high.