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Information technology — Open Systems Interconnection — The Directory —

Part 6: Selected attribute types

Technologies de l'information — Interconnexion de systèmes ouverts (OSI) — L'annuaire

Partie 6: Types d'attributs sélectionnés

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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 9594-6 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 Rec. ITU-T X.520 (10/2012).

This seventh edition cancels and replaces the sixth edition (ISO/IEC 9594-6:2008), which has been technically revised. It also incorporates the Technical Corrigenda ISO/IEC 9594-6:2008/Cor.1:2011, ISO/IEC 9594-6:2008/Cor.2:2012 and ISO/IEC 9594-6:2008/Cor.3:2013.

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*

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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 types which may be found useful across a range of applications of the Directory, as well as a number of standard attribute syntaxes and matching rules. One particular use for many of the attributes defined herein is in the formation of names, particularly for the classes of objects defined in Rec. ITU-T X.521 | ISO/IEC 9594-7.

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 seventh edition technically revises and enhances the sixth edition of this Recommendation | International Standard.

This seventh 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 six editions, except for those specifically assigned to version 2, are accommodated using the rules of extensibility defined in Rec. ITU-T X.519 | ISO/IEC 9594-5.

Annex A, which is an integral part of this Recommendation | International Standard, provides the ASN.1 notation for the complete module which defines the attributes, attribute syntaxes and matching rules.

Annex B, which is not an integral part of this Recommendation | International Standard, provides a table of attribute types, for easy reference.

Annex C, which is not an integral part of this Recommendation | International Standard, provides an example of upper bounds value constraints. These constraints are not reflected in these Directory Specifications, but are provided as a reference for those implementations applying these constraints.

Annex D, which is not an integral part of this Recommendation | International Standard, lists alphabetically the attributes and matching rules defined in this Directory Specification.

Annex E, which is not an integral part of this Recommendation | International Standard, gives examples relevant to the definition of zonal matching.

Annex F, which is not an integral part of this Recommendation | International Standard, describes how a directory distinguished name may be based on object identifiers and on Uniform Resource Names (URNs).

Annex G, which is not an integral part of this Recommendation | International Standard, describes an alternative way of generating directory distinguished based on object identifiers. It contains information retrieved from Rec. ITU-T X.660 | ISO/IEC 9834-1.

Annex H, 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
RECOMMENDATION ITU-T

Information technology – Open Systems Interconnection – The Directory: Selected attribute types

SECTION 1 – GENERAL

1 Scope

This Recommendation | International Standard defines a number of attribute types and matching rules which may be found useful across a range of applications of the Directory.

Attribute types and matching rules fall into three categories, as described below.

Some attribute types and matching rules are used by a wide variety of applications or are understood and/or used by the Directory itself.

NOTE 1 – It is recommended that an attribute type or matching rule defined in this Recommendation | International Standard be used, in preference to the generation of a new one, whenever it is appropriate for the application.

NOTE 2 – The attribute and context types definitions by this Recommendation | International Standard have some associated semantics. Such specifications should not be used in situations where these semantics do not apply.

Some attribute types and matching rules are internationally standardized, but are application-specific. These are defined in the standards associated with the application concerned.

Any administrative authority can define its own attribute types and matching rules for any purpose. These are not internationally standardized, and are available to others beyond the administrative authority which created them only through bilateral agreement.

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

- Recommendation ITU-T X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The basic model.*
- Recommendation ITU-T X.500 (2012) | ISO/IEC 9594-1:2014, *Information technology – Open Systems Interconnection – The Directory: Overview of concepts, models and services.*
- Recommendation ITU-T X.501 (2012) | ISO/IEC 9594-2:2014, *Information technology – Open Systems Interconnection – The Directory: Models.*
- Recommendation ITU-T X.509 (2012) | ISO/IEC 9594-8:2014, *Information technology – Open Systems Interconnection – The Directory: Public-key and attribute certificate frameworks.*
- Recommendation ITU-T X.511 (2012) | ISO/IEC 9594-3:2014, *Information technology – Open Systems Interconnection – The Directory: Abstract service definition.*
- Recommendation ITU-T X.518 (2012) | ISO/IEC 9594-4:2014, *Information technology – Open Systems Interconnection – The Directory: Procedures for distributed operation.*
- Recommendation ITU-T X.519 (2012) | ISO/IEC 9594-5:2014, *Information technology – Open Systems Interconnection – The Directory: Protocol specifications.*
- Recommendation ITU-T X.521 (2012) | ISO/IEC 9594-7:2014, *Information technology – Open Systems Interconnection – The Directory: Selected object classes.*

- Recommendation ITU-T X.525 (2012) | ISO/IEC 9594-9:2014, *Information technology – Open Systems Interconnection – The Directory: Replication*.
- Recommendation ITU-T X.660 (2008) | ISO/IEC 9834-1:2008, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities: General procedures and top arcs of the International Object Identifier tree*.
- Recommendation ITU-T X.667 (2008) | ISO/IEC 9834-8:2008, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities: Generation and registration of Universally Unique Identifiers (UUIDs) and their use as ASN.1 object identifier components*.
- Recommendation ITU-T X.668 (2008) | ISO/IEC 9834-9:2008, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities: Registration of object identifier arcs for applications and services using tag-based identification*.
- Recommendation ITU-T X.680 (2008) | ISO/IEC 8824-1:2008, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation*.
- Recommendation ITU-T X.681 (2008) | ISO/IEC 8824-2:2008, *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification*.
- Recommendation ITU-T X.682 (2008) | ISO/IEC 8824-3:2008, *Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification*.
- Recommendation ITU-T X.683 (2008) | ISO/IEC 8824-4:2008, *Information technology – Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications*.

2.2 Other references

- Recommendation ITU-T E.123 (2001), *Notation for national and international telephone numbers, e-mail addresses and web addresses*.
- Recommendation ITU-T E.164 (2005), *The international public telecommunication numbering plan*.
- Recommendation ITU-T F.1 (1998), *Operational provisions for the international public telegram service*.
- Recommendation CCITT F.31 (1988), *Telegram retransmission system*.
- Recommendation CCITT F.401 (1992), *Message handling services: Naming and addressing for public message handling services*.
- Recommendation ITU-T T.30 (2005), *Procedures for document facsimile transmission in the general switched telephone network*.
- Recommendation ITU-T T.51 (1992), *Latin based coded character sets for telematic services*.
- Recommendation ITU-T T.62 (1993), *Control procedures for teletex and Group 4 facsimile services*.
- Recommendation ITU-T X.121 (2000), *International numbering plan for public data networks*.
- Recommendation ITU-T Y.2213 (2008), *NGN service requirements and capabilities for network aspects of applications and services using tag-based identification*.
- 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: Code for formerly used names of countries*.
- ISO 639-2:1998, *Codes for the representation of names of languages – Part 2: Alpha-3 code*.
- ISO/IEC/IEEE 9945:2009, *Information technology – Portable Operating System Interface (POSIX) – Base Specifications, Issue 7*.
- ISO/IEC 15897:2001, *Information technology – User interfaces – Procedures for the registration of cultural elements*.
- IETF RFC 3406 (2002), *Uniform Resource Names (URN) Namespace Definition Mechanisms*.
- IETF RFC 3454 (2003), *Preparation of Internationalized Strings ("stringprep")*.
- IETF RFC 3641 (2003), *Generic String Encoding Rules (GSER) for ASN.1 Types*.
- IETF RFC 3642 (2003), *Common Elements of Generic String Encoding Rules (GSER) Encodings*.
- IETF RFC 3672 (2003), *Subentries in the Lightweight Directory Access Protocol (LDAP)*.
- IETF RFC 3986 (2005), *Uniform Resource Identifier (URI): Generic Syntax*.

- IETF RFC 4510 (2006), *Lightweight Directory Access Protocol (LDAP): Technical Specification Road Map*.
- IETF RFC 4512 (2006), *Lightweight Directory Access Protocol (LDAP): Directory Information Models*.
- IETF RFC 4514 (2006); *Lightweight Directory Access Protocol (LDAP): String Representation of Distinguished Names*.
- IETF RFC 4517 (2006), *Lightweight Directory Access Protocol (LDAP): Syntaxes and Matching Rules*.
- IETF RFC 4519 (2006), *Lightweight Directory Access Protocol (LDAP): Schema for User Applications*.
- IETF RFC 4520 (2006), *Internet Assigned Numbers Authority (IANA) Considerations for the Lightweight Directory Access Protocol (LDAP)*.
- IETF RFC 4792 (2007), *Encoding Instructions for the Generic String Encoding Rules (GSER)*.
- The Unicode Consortium. *The Unicode Standard, Version 4.0.0*, defined by: *The Unicode Standard, Version 4.0* (Reading, MA, Addison-Wesley, 2003. ISBN 0-321-18578-1).
- *Unicode Standard Annex #15: Unicode Normalization Forms*, by Mark Davis and Martin Dürst. An integral part of *The Unicode Standard, Version 4.0*.
- National Imagery and Mapping Agency (NIMA): TR 8350.2, DoD Word Geodetic System 1984.

2.3 ISO/IEC Standards

- ISO/IEC 10646:2012, *Information technology – Universal Coded Character Set (UCS)*.