
**Information technology — Open Systems
Interconnection — The Directory:
Overview of concepts, models and
services**

*Technologies de l'information — Interconnexion de systèmes ouverts
(OSI) — L'Annuaire: Vue d'ensemble des concepts, modèles et
services*

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Contents

	<i>Page</i>
1 Scope	1
2 Normative references.....	1
3 Definitions	2
4 Abbreviations	4
5 Conventions.....	4
6 Overview of the Directory	4
7 The Directory Information Base (DIB)	5
8 The Directory service	7
9 The distributed Directory.....	9
10 Access control in the Directory	12
11 Replication in the Directory.....	13
12 Directory protocols	15
13 Systems management of the Directory	16
Annex A – Applying the Directory.....	17
Annex B – Amendments and corrigenda	21

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. 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 part of ISO/IEC 9594 may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 9594-1 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 Recommendation X.500.

This third edition cancels and replaces the second edition (ISO/IEC 9594-1:1995), of which it constitutes a minor revision.

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: Authentication framework*
- *Part 9: Replication*
- *Part 10: Use of systems management for administration of the Directory*

Annex A forms a normative part of this part of ISO/IEC 9594. Annex B is for information only.

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 which 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 introduces and models the concepts of the Directory and of the DIB and overviews the services and capabilities which they provide. Other Recommendations | International Standards make use of these models in defining the abstract service provided by the Directory, and in specifying the protocols through which this service can be obtained or propagated.

This third edition technically revises and enhances, but does not replace, the second edition of this Recommendation | International Standard. Implementations may still claim conformance to the second edition. However, at some point, the second edition will not be supported (i.e. reported defects will no longer be resolved). It is recommended that implementations conform to this third edition as soon as possible.

This third edition specifies version 1 and version 2 of the Directory protocols.

The first and second editions also specified version 1. Most of the services and protocols specified in this edition are designed to function under version 1. When version 1 has been negotiated, differences between the services and between the protocols defined in the three editions are accommodated using the rules of extensibility defined in the 1997 edition of ITU-T Rec. X.519 | ISO/IEC 9594-5. 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.

Implementors should note that a defect resolution process exists and that corrections may be applied to this Recommendation | International Standard in the form of technical corrigenda. The identical corrections will be applied to this Recommendation | International Standard in the form of an Implementor's Guide. A list of approved technical corrigenda for this Recommendation | International Standard can be obtained from the subcommittee secretariat. Published technical corrigenda are available from your national standards organization. The Implementor's Guide may be obtained from the ITU Web site.

Annex A, which is an integral part of this Recommendation | International Standard, describes the types of use to which the Directory can be applied.

Annex B, 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: OVERVIEW OF CONCEPTS, MODELS AND SERVICES

1 Scope

The Directory provides the directory capabilities required by OSI applications, OSI management processes, other OSI layer entities, and telecommunications services. Among the capabilities which it provides are those of "user-friendly naming", whereby objects can be referred to by names which are suitable for citing by human users (though not all objects need have user-friendly names); and "name-to-address mapping" which allows the binding between objects and their locations to be dynamic. The latter capability allows OSI networks, for example, to be "self-configuring" in the sense that addition, removal and the changes of object location do not affect OSI network operation.

The Directory is not intended to be a general-purpose database system, although it may be built on such systems. It is assumed, for instance, that, as is typical with communications directories, there is a considerably higher frequency of "queries" than of updates. The rate of updates is expected to be governed by the dynamics of people and organizations, rather than, for example, the dynamics of networks. There is also no need for instantaneous global commitment of updates; transient conditions where both old and new versions of the same information are available, are quite acceptable.

It is a characteristic of the Directory that, except as a consequence of differing access rights or unpropagated updates, the results of directory queries will not be dependent on the identity or location of the inquirer. This characteristic renders the Directory unsuitable for some telecommunications applications, for example some types of routing. For cases where the results are dependent on the identity of the inquirer, access to directory information and updates of the Directory may be denied.

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.411 (1995) | ISO/IEC 10021-4:1997, *Information technology – Message Handling Systems (MHS): Message Transfer System: Abstract service definition and procedures.*
- ITU-T Recommendation X.501 (1993) | ISO/IEC 9594-2:1995, *Information technology – Open Systems Interconnection – The Directory: Models.*
- ITU-T Recommendation X.509 (1993) | ISO/IEC 9594-8:1995, *Information technology – Open Systems Interconnection – The Directory: Authentication framework.*
- ITU-T Recommendation X.511 (1993) | ISO/IEC 9594-3:1995, *Information technology – Open Systems Interconnection – The Directory: Abstract service definition.*
- ITU-T Recommendation X.518 (1993) | ISO/IEC 9594-4:1995, *Information technology – Open Systems Interconnection – The Directory: Procedures for distributed operation.*

- ITU-T Recommendation X.519 (1993) | ISO/IEC 9594-5:1995, *Information technology – Open Systems Interconnection – The Directory: Protocol specifications.*
- ITU-T Recommendation X.520 (1993) | ISO/IEC 9594-6:1995, *Information technology – Open Systems Interconnection – The Directory: Selected attribute types.*
- ITU-T Recommendation X.521 (1993) | ISO/IEC 9594-7:1995, *Information technology – Open Systems Interconnection – The Directory: Selected object classes.*
- ITU-T Recommendation X.525 (1993) | ISO/IEC 9594-9:1995, *Information technology – Open Systems Interconnection – The Directory: Replication.*
- ITU-T Recommendation X.530 (1997) | ISO/IEC 9594-10:1997, *Information technology – Open Systems Interconnection – The Directory: Use of systems management for administration of the Directory.*
- ITU-T Recommendation X.830 (1995) | ISO/IEC 11586-1:1996, *Information technology – Open Systems Interconnection – Generic upper layers security: Overview, models and notation.*
- ITU-T Recommendation X.831 (1995) | ISO/IEC 11586-2:1995, *Information technology – Open Systems Interconnection – Generic upper layers security: Security Exchange Service Element (SESE) service definition.*
- ITU-T Recommendation X.832 (1995) | ISO/IEC 11586-3:1995, *Information technology – Open Systems Interconnection – Generic upper layers security: Security Exchange Service Element (SESE) protocol specification.*
- ITU-T Recommendation X.833 (1995) | ISO/IEC 11586-4:1995, *Information technology – Open Systems Interconnection – Generic upper layers security: Protecting transfer syntax specification.*
- ITU-T Recommendation X.880 (1994) | ISO/IEC 13712-1:1995, *Information technology – Remote Operations: Concepts, model and notation.*

2.2 Paired Recommendations | International Standards equivalent in technical content

- CCITT Recommendation X.200 (1988), *Reference Model of Open Systems Interconnection for CCITT applications.*
ISO 7498:1984, *Information processing systems – Open Systems Interconnection – Basic Reference Model.*

3 Definitions

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

3.1 OSI Reference Model definitions

The following terms are defined in CCITT Rec. X.200 and ISO 7498:

- a) application-entity;
- b) Application Layer;
- c) application-process;
- d) application protocol data unit;
- e) application service element;
- f) Network Service Access Point.

3.2 Directory model definitions

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

- a) access control;
- b) Administration Directory Management Domain;
- c) alias;
- d) attribute;

- e) attribute type;
- f) attribute value;
- g) authentication;
- h) context;
- i) Directory Information Tree (DIT);
- j) Directory Management Domain (DMD);
- k) Directory System Agent (DSA);
- l) Directory User Agent (DUA);
- m) distinguished name;
- n) entry;
- o) name;
- p) object (of interest);
- q) Private Directory Management Domain;
- r) relative distinguished name;
- s) root;
- t) schema;
- u) security policy;
- v) subordinate object;
- w) superior entry;
- x) superior object;
- y) tree.

3.3 Distributed Operation definitions

The following terms are defined in ITU-T Rec. X.518 | ISO/IEC 9594-4:

- a) uni-chaining;
- b) multi-chaining;
- c) referral.

3.4 Replication definitions

The following terms are defined in ITU-T Rec. X.525 | ISO/IEC 9594-9:

- a) caching;
- b) cache copy;
- c) entry copy;
- d) master DSA;
- e) replication;
- f) shadow consumer;
- g) shadow supplier;
- h) shadowed information;
- i) shadowing agreement.

3.5 Basic directory definitions

The following terms are defined in this Recommendation | International Standard:

3.5.1 the Directory: A collection of open systems cooperating to provide directory services.

3.5.2 directory information base (DIB): The set of information managed by the Directory.

3.5.3 (directory) user: The end user of the Directory, i.e. the entity or person which accesses the Directory.