

INTERNATIONAL STANDARD

ISO/IEC 9594-3

Eighth edition
2017-05

Information technology — Open Systems Interconnection — The Directory —

Part 3: Abstract service definition

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

Partie 3: Définition du service abstrait

Withholding



Reference number
ISO/IEC 9594-3:2017(E)

© ISO/IEC 2017

Withdrawn



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This eighth edition cancels and replaces the seventh edition (ISO/IEC 9594-3:2014), which has been technically revised.

This document was prepared by ISO/IEC JTC 1, *Information technology*, SC 6, *Telecommunications and information exchange between systems*, in collaboration with ITU-T. The identical text is published as ITU-T X.511 (10/2016).

A list of all parts in the ISO/IEC 9594 series, published under the general title *Information technology — Open Systems Interconnection — The Directory*, can be found on the ISO website.

CONTENTS

	<i>Page</i>
1 Scope	1
2 Normative references.....	1
2.1 Identical Recommendations International Standards	1
2.2 Other references	2
3 Definitions.....	2
3.1 OSI Reference Model security architecture definitions.....	2
3.2 Basic Directory definitions.....	2
3.3 Directory model definitions	2
3.4 Directory information base definitions.....	2
3.5 Directory entry definitions	2
3.6 Name definitions	3
3.7 Distributed operations definitions	3
3.8 Abstract service definitions	3
4 Abbreviations	4
5 Conventions.....	4
6 Overview of the Directory service.....	5
7 Information types and common procedures	5
7.1 Introduction.....	5
7.2 Information types defined elsewhere	5
7.3 Common arguments	6
7.4 Common results	9
7.5 Service controls.....	10
7.6 Entry information selection.....	12
7.7 Entry information	15
7.8 Filter	17
7.9 Paged results.....	20
7.10 Security parameters.....	22
7.11 Common elements of procedure for access control.....	23
7.12 Managing the DSA Information Tree	25
7.13 Procedures for families of entries.....	25
8 Directory authentication	26
8.1 Simple authentication procedure.....	26
8.2 Password policy	28
9 Bind, Unbind operations, Change Password and Administer Password operations	31
9.1 Directory Bind.....	31
9.2 Directory Unbind	34
10 Directory Read operations.....	34
10.1 Read	34
10.2 Compare	37
10.3 Abandon	40
11 Directory Search operations	40
11.1 List	40
11.2 Search.....	44
12 Directory Modify operations	54
12.1 Add Entry.....	55
12.2 Remove Entry.....	57
12.3 Modify Entry.....	58
12.4 Modify DN.....	62
12.5 Change Password	65
12.6 Administer Password.....	65

	<i>Page</i>
13 Operations for LDAP messages	66
13.1 LDAP Transport operation	67
13.2 Linked LDAP operation	69
14 Errors	69
14.1 Error precedence	69
14.2 Abandoned	70
14.3 Abandon Failed	70
14.4 Attribute Error	71
14.5 Name Error	72
14.6 Referral	73
14.7 Security Error	73
14.8 Service Error	74
14.9 Update Error	76
15 Analysis of search arguments	77
15.1 General check of search filter	78
15.2 Check of request-attribute-profiles	79
15.3 Check of controls and hierarchy selections	80
15.4 Check of matching use	81
Annex A – Abstract Service in ASN.1	82
Annex B – Operational semantics for Basic Access Control	98
Annex C – Examples of searching families of entries	111
C.1 Single family example	111
C.2 Multiple families example	112
Annex D – External ASN.1 module	115
Annex E – Use of Protected Passwords for Bind operations	119
Annex F – Amendments and corrigenda	120

WITHDRAWN

Introduction

This Recommendation | International Standard, together with the 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 the capabilities provided by the Directory to its users.

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

This eighth 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 eight 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 module for the Directory abstract service.

Annex B, which is not an integral part of this Recommendation | International Standard, provides charts that describe the semantics associated with Basic Access Control as it applies to the processing of a Directory operation.

Annex C, which is not an integral part of this Recommendation | International Standard, gives examples of the use of families of entries.

Annex D, which is not an integral part of this Recommendation | International Standard, includes an updated copy of an external ASN.1 module referenced by this Directory Specification.

Annex E, which is not an integral part of this Recommendation | International Standard, provides a suggested technique for Bind protected password.

Annex F, 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:
Abstract service definition****1 Scope**

This Recommendation | International Standard defines in an abstract way the externally visible service provided by the Directory.

This Recommendation | International Standard does not specify individual implementations or products.

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.500 (2016) | ISO/IEC 9594-1:2017, *Information technology – Open Systems Interconnection – The Directory: Overview of concepts, models and services.*
- Recommendation ITU-T X.501 (2016) | ISO/IEC 9594-2:2017, *Information technology – Open Systems Interconnection – The Directory: Models.*
- Recommendation ITU-T X.509 (2016) | ISO/IEC 9594-8:2017, *Information technology – Open Systems Interconnection – The Directory: Public-key and attribute certificate frameworks.*
- Recommendation ITU-T X.518 (2016) | ISO/IEC 9594-4:2017, *Information technology – Open Systems Interconnection – The Directory: Procedures for distributed operation.*
- Recommendation ITU-T X.519 (2016) | ISO/IEC 9594-5:2017, *Information technology – Open Systems Interconnection – The Directory: Protocol specifications.*
- Recommendation ITU-T X.520 (2016) | ISO/IEC 9594-6:2017, *Information technology – Open Systems Interconnection – The Directory: Selected attribute types.*
- Recommendation ITU-T X.521 (2016) | ISO/IEC 9594-7:2017, *Information technology – Open Systems Interconnection – The Directory: Selected object classes.*
- Recommendation ITU-T X.525 (2016) | ISO/IEC 9594-9:2017, *Information technology – Open Systems Interconnection – The Directory: Replication.*
- Recommendation ITU-T X.680 (2015) | ISO/IEC 8824-1:2015, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*
- Recommendation ITU-T X.681 (2015) | ISO/IEC 8824-2:2015, *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification.*
- Recommendation ITU-T X.682 (2015) | ISO/IEC 8824-3:2015, *Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification.*
- Recommendation ITU-T X.683 (2015) | ISO/IEC 8824-4:2015, *Information technology – Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications.*

2.2 Paired Recommendations | International Standards equivalent in technical content

- Recommendation ITU-T X.800 (1991), *Security architecture for Open Systems Interconnection for CCITT applications.*
ISO 7498-2:1989, *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 2: Security Architecture.*

2.3 Additional references

- Recommendation ITU-T X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The basic model*.
- IETF RFC 2025 (1996), *The Simple Public-Key GSS-API Mechanism (SPKM)*.
- IETF RFC 4422 (2006), *Simple Authentication and Security Layer (SASL)*.
- IETF RFC 4511 (2006), *Lightweight Directory Access Protocol (LDAP): The Protocol*.

Withdrawn