INTERNATIONAL STANDARD

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Information technology — Open Systems Interconnection — The Directory —

Part 5:
Protocol specifications

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

Partie 5: Spécifications du protocole

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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 9594-5 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.519 (10/2012).

This seventh edition cancels and replaces the sixth edition (ISO/IEC 9594-5:2008), which has been technically revised. It also incorporates the Technical Corrigenda ISO/IEC 9594-5:2008/Cor.1:2011 and ISO/IEC 9594-5:2008/Cor.2:2012.

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*

CONTENTS

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 specifies the application service elements and application contexts for two protocols – the Directory Access Protocol (DAP) and the Directory System Protocol (DSP). The DAP provides for access to the Directory to retrieve or modify Directory information. The DSP provides for the chaining of requests to retrieve or modify Directory information to other parts of the distributed Directory System where the information may be held.

In addition, this Recommendation | International Standard specifies the application service elements and application contexts for the Directory Information Shadowing Protocol (DISP) and the Directory Operational Binding Management Protocol (DOP). The DISP provides for the shadowing of information held in one DSA to another DSA. The DOP provides for the establishment, modification and termination of bindings between pairs of DSAs for the administration of relationships between the DSAs (such as for shadowing or hierarchical relationships).

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 this edition of 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 common specifications for the Directory protocols.

Annex B, which is an integral part of this Recommendation | International Standard, provides the ASN.1 module for the OSI protocol specification.

Annex C, which is an integral part of this Recommendation | International Standard, provides the ASN.1 module for the Directory OSI protocols.

Annex D, which is an integral part of this Recommendation | International Standard, provides the ASN.1 module for the IDM protocol specification.

Annex E, which is an integral part of this Recommendation | International Standard, provides the ASN.1 module for the Directory IDM protocols.

Annex F, which is an integral part of this Recommendation | International Standard, provides the ASN.1 module which contains all the ASN.1 object identifiers assigned to identify operational binding types in this series of Recommendations | International Standards.

Annex G, 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: Protocol specifications

1 Scope

This Recommendation | International Standard specifies the Directory Access Protocol, the Directory System Protocol, the Directory Information Shadowing Protocol, and the Directory Operational Binding Management Protocol which fulfil the abstract services specified in Rec. ITU-T X.511 | ISO/IEC 9594-3, Rec. ITU-T X.518 | ISO/IEC 9594-4, Rec. ITU-T X.525 | ISO/IEC 9594-9, and Rec. ITU-T X.501 | ISO/IEC 9594-2.

2 References

2.1 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.

2.1.1 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.213 (2001) | ISO/IEC 8348:2002, *Information technology – Open Systems Interconnection – Network service definition.*

– Recommendation ITU-T X.214 (1995) | ISO/IEC 8072:1996, *Information technology – Open Systems Interconnection – Transport service definition.*

– 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.520 (2012) | ISO/IEC 9594-6:2014, *Information technology – Open Systems Interconnection – The Directory: Selected attribute types.*

– 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.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.*

– Recommendation ITU-T 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).*

2.1.2 ISO/IEC Standards

– ISO/IEC 10646:2003, *Information technology – Universal Multiple-Octet Coded Character Set (UCS).*

2.1.3 Other references

– Recommendation ITU-T E.164 (2005), *The international public telecommunication numbering plan.*

– Recommendation ITU-T X.121 (2000), *International numbering plan for public data networks.*

– IETF RFC 793 (1981), *Transmission Control Protocol – DARPA Internet Program – Protocol Specification.*

– IETF RFC 1738 (1994), *Uniform Resource Locators (URL).*

– IETF RFC 2025 (1996), *The Simple Public-Key GSS-API Mechanism (SPKM).*

– IETF RFC 2246 (1999), *The TLS Protocol Version 1.0.*

– IETF RFC 3546 (2003), *Transport Layer Security (TLS) Extensions.*

– IETF RFC 3986 (2005), *Uniform Resource Identifier (URI): Generic Syntax.*

– IETF RFC 4511 (2006), *Lightweight Directory Access Protocol (LDAP): The Protocol.*

2.2 Non-normative references

– Recommendation ITU-T X.217 (1995) | ISO/IEC 8649:1996, *Information technology – Open Systems Interconnection – Service definition for the Association Control Service Element.*

– Recommendation ITU-T X.224 (1995) | ISO/IEC 8073:1997, *Information technology – Open Systems Interconnection – Protocol for providing the connection-mode transport service.*

– Recommendation ITU-T X.225 (1995) | ISO/IEC 8327-1:1996, *Information technology – Open Systems Interconnection – Connection-oriented Session protocol: Protocol specification.*

– Recommendation ITU-T X.226 (1994) | ISO/IEC 8823-1:1994, *Information technology – Open Systems Interconnection – Connection-oriented Presentation protocol: Protocol specification.*

– Recommendation ITU-T X.227 (1995) | ISO/IEC 8650-1:1996, *Information technology – Open Systems Interconnection – Connection-oriented protocol for the Association Control Service Element: Protocol specification.*

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

– Recommendation ITU-T X.881 (1994) | ISO/IEC 13712-2:1995, *Information technology – Remote Operations: OSI realizations – Remote Operations Service Element (ROSE) service definition.*

– IETF RFC 896 (1984), *Congestion Control in IP/TCP Internetworks.*

– IETF RFC 1006 (1987), *ISO Transport Service on top of the TCP Version: 3.*

– IETF RFC 1277 (1991), *Encoding Network Addresses to Support Operation over Non-OSI Lower Layers.*

– IETF RFC 2126 (1997), *ISO Transport Service on top of TCP (ITOT).*