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Information technology — Open Systems Interconnection — Connectionless protocol for the Application Service Object Association Control Service Element

Technologies de l'information — Interconnexion des systèmes ouverts — Protocole en mode sans connexion pour l'élément de service de contrôle d'association des objets de service d'application

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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.

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 International Standard 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 15955 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*

Introduction

This Recommendation | International Standard is one of a set of Recommendations | International Standards produced to facilitate the interconnection of information processing systems. It is related to other ITU-T Recommendations | International Standards in the set as defined by the Reference Model for Open Systems Interconnection (see ITU-T Rec. X.200 | ISO/IEC 7498-1). The reference model subdivides the areas of standardization for interconnection into a series of layers of specification, each of manageable size.

The goal of Open Systems Interconnection is to allow, with a minimum of technical agreement outside the Interconnection standards, the interconnection of information processing systems:

- from different manufacturers;
- under different managements;
- of different levels of complexity; and
- of different technologies.

This Recommendation | International Standard specifies the protocol for the A-UNIT-DATA service for the Association Control Service Element (ACSE). The A-UNIT-DATA service provides for information transfer between application-entities utilizing the connectionless presentation service. This service is intended to be applicable to a wide range of application process communication requirements.

This Recommendation | International Standard includes an Annex A that describes the protocol machine of ACSE in terms of a state table.

This protocol machine is referred to as the Association Control Protocol Machine (ACPM).

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – CONNECTIONLESS PROTOCOL FOR THE APPLICATION SERVICE OBJECT ASSOCIATION CONTROL SERVICE ELEMENT

1 Scope

This Recommendation | International Standard specifies:

a) procedures for the transfer of information among application-service-objects (ASOs); and

b) the abstract and concrete syntax for the representation of the A-UNIT-DATA ACSE APDU.

The A-UNIT-DATA procedure is defined in terms of:

a) The interactions between peer ACSE protocol machines by the use of a supporting service; and

b) the interaction between an ACSE protocol machine, its service-provider and its service-user.

These procedures are applicable to instances of communication between systems which wish to communicate in an open systems interconnection environment in a connectionless mode.

This Recommendation | International Standard also specifies conformance requirements for systems implementing this procedure. It does not contain tests which can be used to demonstrate conformance.

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 this 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.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic reference model: The basic model.*

– ITU-T Recommendation X.207 (1993) | ISO/IEC 9545:1994, *Information technology – Open Systems Interconnection – Application layer structure.*

– ITU-T Recommendation X.210 (1993) | ISO/IEC 10731:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: Conventions for the definition of OSI services.*

– ITU-T Recommendation X.215 (1995) | ISO/IEC 8326:1996, *Information technology – Open Systems Interconnection – Session service definition.*

– ITU-T Recommendation X.215 (1995)/Amd.1 (1997) | ISO/IEC 8326:1996/Amd.1:1998, *Information technology – Open Systems Interconnection – Session service definition – Amendment 1: Efficiency enhancements.*

– ITU-T Recommendation X.215 (1995)/Amd.2 (1997) | ISO/IEC 8326:1996/Amd.2:1998, *Information technology – Open Systems Interconnection – Session service definition – Amendment 2: Nested connections functional unit.*

- ITU-T Recommendation X.216 (1994) | ISO/IEC 8822:1994, *Information technology – Open Systems Interconnection – Presentation service definition.*
- ITU-T Recommendation X.216 (1994)/Amd.1 (1997) | ISO/IEC 8822:1994/Amd.1:1998, *Information technology – Open Systems Interconnection – Presentation service definition – Amendment 1: Efficiency enhancements.*
- ITU-T Recommendation X.216 (1994)/Amd.2 (1997) | ISO/IEC 8822:1994/Amd.2:1998, *Information technology – Open Systems Interconnection – Presentation service definition – Amendment 2: Nested connections functional unit.*
- ITU-T Recommendation X.217 *bis* (1998) | ISO/IEC 15953:1999, *Information technology – Open Systems Interconnection – Service definition for the Application Service Object Association Control Service Element.*
- ITU-T Recommendation X.227 *bis* (1998) | ISO/IEC 15954:1999, *Information technology – Open Systems Interconnection – Connection-mode protocol for the Application Service Object Association Control Service Element.*
- ITU-T Recommendation X.257 (1995) | ISO/IEC 10035-2:1995, *Information technology – Open Systems Interconnection – Connectionless protocol for the association control service element: Protocol Implementation Conformance Statement (PICS) proforma.*
- ITU-T Recommendation X.650 (1996) | ISO/IEC 7498-3:1997, *Information technology – Open Systems Interconnection – Basic Reference Model: Naming and addressing.*
- CCITT Recommendation X.660 (1992) | ISO/IEC 9834-1:1993, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities: General procedures.*
- CCITT Recommendation X.665 (1992) | ISO/IEC 9834-6:1993, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities: Application processes and application entities.*
- ITU-T Recommendation X.680 (1994) | ISO/IEC 8824-1:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*
- ITU-T Recommendation X.680 (1994)/Amd.1 (1995) | ISO/IEC 8824-1:1995/Amd.1:1996, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation – Amendment 1: Rules of extensibility.*
- ITU-T Recommendation X.681 (1994) | ISO/IEC 8824-2:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification.*
- ITU-T Recommendation X.681 (1994)/Amd.1 (1995) | ISO/IEC 8824-2:1995/Amd.1:1996, *Information technology – Abstract Syntax Notation One (ASN.1) – Information object specification – Amendment 1: Rules of extensibility.*
- ITU-T Recommendation X.682 (1994) | ISO/IEC 8824-3:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification.*
- ITU-T Recommendation X.683 (1994) | ISO/IEC 8824-4:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications.*
- ITU-T Recommendation X.690 (1994) | ISO/IEC 8825-1:1995, *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.691 (1995) | ISO/IEC 8825-2:1996, *Information technology – ASN.1 encoding rules – Specification of Packed Encoding Rules (PER).*

2.2 Paired Recommendations | International Standards equivalent in technical content

- CCITT Recommendation X.209 (1988), *Specification of basic encoding rules for Abstract Syntax Notation One (ASN.1).*

  ISO/IEC 8825:1990, *Information technology – Open Systems Interconnection – Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1).*

- CCITT Recommendation 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.*

3 Definitions

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

3.1 Reference model definitions

This Recommendation | International Standard is based on the concepts developed in ITU-T Rec. X.200 | ISO/IEC 7498-1 and makes use of the following terms defined in them.

a) Application Layer;

b) application-process;

c) application-entity;

d) application-service-element;

e) application-protocol-data-unit;

f) connectionless-mode presentation-service;

g) connectionless-mode session-service; and

h) (N)-connectionless-mode transmission.

3.2 Naming and addressing definitions

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

a) application-entity qualifier;

b) application-entity invocation-identifier;

c) application-process title;

d) application-process invocation-identifier; and

e) presentation address.

3.3 Service conventions definitions

This Recommendation | International Standard makes use of the following terms defined in ITU-T Rec. X.210 | ISO/IEC 10731:

a) service-provider:

b) service-user;

c) non-confirmed service;

d) primitive;

e) request (primitive);

f) indication (primitive);

g) submit; and

h) deliver.

3.4 Presentation service definitions

This Recommendation | International Standard makes use of the following terms defined in ITU-T Rec. X.216 | ISO/IEC 8822:

a) presentation data value;

b) abstract syntax; and

c) abstract syntax name.

3.5 ACSE service definitions

This Recommendation | International Standard makes use of the following terms defined in ITU-T Rec. X.217 *bis* | ISO/IEC 15953.

a) application-association;

b) application context;

c) Association Control Service Element;

d) ACSE service-user;

e) ACSE service-provider;

f) requester; and

g) acceptor.

3.6 Application Layer Structure definitions

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

a) application-entity invocation,

b) application-service-object,

c) ASO-context,

d) ASO-association,

e) ASO-invocation,

f) ASOI-tag,

g) ASOI-identifier,

h) ASO-name,

i) ASO-qualifier,

j) ASO-title,

k) child ASO,

l) parent ASO; and

m) control function.

4 Abbreviations

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

4.1 Data Units

APDU application-protocol-data-unit

4.2 Types of application-protocol-data-units

The following abbreviation has been given to the application-protocol-data-unit defined in this Recommendation | International Standard:

AUDT A-UNIT-DATA APDU

4.3 Other abbreviations

The following abbreviations are used in this Recommendation | International Standard:

ACPM	Association Control Protocol Machine
ACSE	Association Control Service Element
AE	application-entity
AEI	application-entity invocation
AP	application-process
APCI	application-protocol-control-information
ASE	application-service-element
ASO	application-service-object
ASOI	ASO-invocation
ASN.1	Abstract Syntax Notation One
CF	control function
ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
OSI	Open Systems Interconnection

5 Conventions

This Recommendation | International Standard employs a tabular presentation of its APDU fields. In 7.1, a table is presented for the AUDT APDU. Each field is summarized using the following notation:

M	Presence is Mandatory
O	Presence is ACPM Option
U	Presence is an ACSE service-user option
req	Source is related request primitive
ind	Sink is related indication primitive
sp	Source or sink is the ACPM

The structure of the AUDT APDU is specified in clause 9 using the abstract syntax notation ASN.1 (see ITU-T Rec. X.680 | ISO/IEC 8824-1).

6 Overview of the protocol

6.1 Service provision

The protocol specified in this Recommendation | International Standard provides the A-UNIT-DATA service defined in ITU-T Rec. X.217 *bis* | ISO/IEC 15953. The connectionless-mode protocol may be mapped to the connectionless-mode presentation service or the connection-mode or connectionless-mode ACSE or an equivalent application layer service. To map A-UNIT-DATA to a connection-mode service, a supporting A-ASSOCIATION must first be established before transmission can begin.

6.2 Use of a supporting service

The ACSE protocol specified in this Recommendation | International Standard uses the IA-UNIT-DATA services to pass information in the form of an AUDT APDU to the supporting service. This Recommendation | International Standard specifies a generic lower service definition that describes the supporting service it requires. Any supporting service that meets these constraints can be used to support this service. In general, the supporting service will either be the connectionless-mode presentation service (see ITU-T Rec. X.216 | ISO/IEC 8822) or the ACSE service (see ITU-T Rec. X.217 *bis* | ISO/IEC 15953).