INTERNATIONAL STANDARD

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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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CONTENTS

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*, in collaboration with ITU-T. The identical text is published as ITU-T Recommendation X.237 bis.

This first edition of ISO/IEC 15955 cancels and replaces ISO/IEC 10035-1:1995 and its Amendment 1:1997, of which it constitutes a technical revision.

Annexes A and C form a normative part of this International Standard. Annex B is for information only.

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).

6.3 Model

The A-UNIT-DATA protocol machine communicates with its service user by means of primitives defined in ITU-T Rec. X.217 *bis* | ISO/IEC 15953 for the A-UNIT-DATA service.

The A-UNIT-DATA protocol machine is driven by the use of the A-UNIT-DATA request primitive and by the IA-UNIT-DATA.deliver primitive.

During an instance of communication, the existence of both the sending and receiving ASOI is presumed. How these ASOIs are created does not require the exchange of PDUs within this protocol and thus is outside the scope of this Recommendation | International Standard.

7 Elements of procedure

The A-UNIT-DATA protocol consists of the A-UNIT-DATA transfer procedure.

7.1 A-UNIT-DATA transfer

7.1.1 Purpose

The A-UNIT-DATA transfer procedure is used to transmit a unit of information from one ASOI to other ASOI(s). It supports the A-UNIT-DATA service.

7.1.2 APDUs used

The A-UNIT-DATA transfer procedure uses the A-UNIT-DATA (AUDT) APDU. The fields of the AUDT APDU are listed in Table 1.

7.1.3 A-UNIT-DATA transfer procedure

This procedure is driven by the following events:

a) an A-UNIT-DATA request primitive from the requester;

b) an AUDT APDU as User data on a IA-UNIT-DATA.deliver primitive.

7.1.3.1 A-UNIT-DATA request primitive

The sending ACPM forms an AUDT APDU using parameter values from the A-UNIT-DATA request primitive and its own stored data (the Protocol Version field and Implementation Information field). It issues an IA-UNIT-DATA.submit primitive using information from the A-UNIT-DATA request primitive. The User data parameter of the IA-UNIT-DATA.submit primitive contains the AUDT APDU.

7.1.3.2 AUDT APDU

The receiving ACPM receives the AUDT APDU as User data on an IA-UNIT-DATA.deliver primitive. If any of the parameters of the IA-UNIT-DATA.deliver primitive or the fields of the AUDT APDU are unacceptable to this ACPM, it discards the AUDT APDU.

7.1.4 Use of the AUDT APDU fields

The AUDT APDU fields are used as follows.

Table 1 – AUDT APDU fields

Field Name	Presence	Source	Sink
Protocol Version	O	sp	sp
ASO-context-name	O	req	ind
Calling AP-title	U	req	ind
Calling AE-qualifier	U	req	ind
Calling AP-invocation-identifier	U	req	ind
Calling AE-invocation-identifier	U	req	ind
Called AP-title	U	req	ind
Called AE-qualifier	U	req	ind
Called AP-invocation-identifier	U	req	ind
Called AE-invocation-identifier	U	req	ind
ASO-name	U	req	ind
P-context	U	req	ind
Authentication-mechanism Name	U	req	ind
Authentication-value	U	req	ind
Implementation Information	O	sp	sp
User data	M	req	ind

7.1.4.1 Protocol version

– For the sending ACPM: The value assigned to this field is determined within the implementation of the ACPM. It is a variable-length bit string where a bit, set to one, indicates the version of ACSE protocol that this ACPM supports. Bit 0 represents version 1; bit 1 represents version 2, etc. Only one bit can be set by the sending ACPM indicating support of a specific version. No trailing bits higher than the highest version of this Recommendation | International Standard that the sending ACPM supports are included. That is, only one bit which is the last bit of the string is set to one.

– For the receiving ACPM: The receiving ACPM will discard the received AUDT APDU if its version is not supported.

7.1.4.2 ASO-context-name

– For the sending ACPM: This value is determined by the value of the ASO-context-name parameter of the A-UNIT-DATA request primitive.

– For the receiving ACPM: This value is used to determine the value of the ASO-context-name parameter of the A-UNIT-DATA indication primitive, if issued.

NOTE – This field is optional. If backward compatibility with older implementations of ACSE is desired, it must be present.

7.1.4.3 Calling AP-title

– For the sending ACPM: This value is determined by the value of the Calling AP-title parameter of the A-UNIT-DATA request primitive.

– For the receiving ACPM: This value is used to determine the value of the Calling AP-title parameter of the A-UNIT-DATA indication primitive, if issued.

7.1.4.4 Calling AE-qualifier

This field shall only be present if the Calling ASOI-tag parameter of the A-UNIT-DATA request contains precisely one (ASO-qualifier, ASOI-identifier) element, and the ASO-qualifier is non-null.

- For the sending ACPM: This value is determined by the value of the first and only ASO-qualifier in the Calling ASOI-tag parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the first and only ASO-qualifier in the Calling ASOI-tag parameter of the A-UNIT-DATA indication primitive, if issued.

7.1.4.5 Calling AP-invocation-identifier

- For the sending ACPM: This value is determined by the value of the Calling AP-invocation-identifier parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the Calling AP-invocation-identifier parameter of the A-UNIT-DATA indication primitive, if issued.

7.1.4.6 Calling AE-invocation-identifier

This field shall only be present if the Calling ASOI-tag parameter of the A-UNIT-DATA request contains precisely one (ASO-qualifier, ASOI-identifier) element, and the ASOI-identifier is non-null.

- For the sending ACPM: This value is determined by the value of the first and only ASOI-identifier in the Calling ASOI-tag parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the first and only ASOI-identifier in the Calling ASOI-tag parameter of the A-UNIT-DATA indication primitive, if issued.

7.1.4.7 Called AP-title

- For the sending ACPM: This value is determined by the value of the Called AP-title parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the Called AP-title parameter of the A-UNIT-DATA indication primitive, if issued.

7.1.4.8 Called AE-qualifier

This field shall only be present if the Called ASOI-tag parameter of the A-UNIT-DATA request contains precisely one (ASO-qualifier, ASOI-identifier) element, and the ASO-qualifier is non-null.

- For the sending ACPM: This value is determined by the value of the first and only ASO-qualifier in the Called ASOI-tag parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the first and only ASO-qualifier in the Called ASOI-tag parameter of the A-UNIT-DATA indication primitive, if issued.

7.1.4.9 Called AP-invocation-identifier

- For the sending ACPM: This value is determined by the value of the Called AP-invocation-identifier parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the Called AP-invocation-identifier parameter of the A-UNIT-DATA indication primitive, if issued.

7.1.4.10 Called AE-invocation-identifier

This field shall only be present if the Called ASOI-tag parameter of the A-UNIT-DATA request contains precisely one (ASO-qualifier, ASOI-identifier) element, and the ASOI-identifier is non-null.

- For the sending ACPM: This value is determined by the value of the first and only ASOI-identifier in the Called ASOI-tag parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the first and only ASOI-identifier in the Called ASOI-tag parameter of the A-UNIT-DATA indication primitive, if issued.

7.1.4.11 Implementation Information

- For the sending ACPM: The value assigned to this field is determined within the implementation of the ACPM. It contains information specific to the individual implementation of that ACPM.
- For the receiving ACPM: This field does not affect the operation of the ACPM. Any use depends on a common understanding between sending and receiving ACPMs.

7.1.4.12 Calling ASOI-tag

This field shall only be present if the Calling ASOI-tag parameter of the A-UNIT-DATA request primitive contains more than one (ASO-qualifier, ASOI-identifier) element.

NOTE – The field is present even if one or more elements contain null values.

- For the sending ACPM: The value of this field is determined by the value of the ASOI-tag parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the Calling ASOI-tag parameter of the A-UNIT-DATA indication primitive, if issued.

7.1.4.13 Called ASOI-tag

This field shall only be present if the Called ASOI-tag parameter of the A-UNIT-DATA request primitive contains more than one (ASO-qualifier, ASOI-identifier) element.

NOTE – The field is present even if one or more elements contain null values.

- For the sending ACPM: The value of this field is determined by the value of the ASOI-tag parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the Called ASOI-tag parameter of the A-UNIT-DATA indication primitive, if issued.

7.1.4.14 P-context

This field shall be present only if the IA-UNIT-DATA primitive is mapped to a supporting A-service primitive. It identifies the presentation context used for the User-information field of AUDT APDU. The field contains two components, an abstract syntax name and a concrete syntax name.

NOTE 1 – If the IA-UNIT-DATA primitive containing this AUDT-APDU is mapped directly to a P-UNIT-DATA service primitive, the presentation context definition list parameters of the A-UNIT-DATA primitives are mapped directly to the corresponding parameters of the P-UNIT-DATA service primitives.

NOTE 2 – The User-information of an A-UNIT-DATA request primitive mapped to a supporting A-service contains only presentation data values from a single presentation context.

- For the sending ACPM: This value is determined by the value of the Presentation context definition list parameter of the A-UNIT-DATA request primitive, ignoring the Presentation context definition identifier.
- For the receiving ACPM: This value is used to determine the value of the Presentation context definition list parameter of the A-UNIT-DATA indication primitive. The value of the presentation context identifier shall be locally determined.

7.1.4.15 Authentication-mechanism Name

- For the sending ACPM: The value assigned to this field is determined by the value of the Authentication-mechanism Name parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the Authentication-mechanism Name parameter of the A-UNIT-DATA indication primitive, if issued.

7.1.4.16 Authentication-value

- For the sending ACPM: The value assigned to this field is determined by the value of the Authentication-value parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the Authentication-value parameter of the A-UNIT-DATA indication primitive, if issued.

  NOTE – There is no need for an "ACSE requirements" field in the connectionless protocol. The use of the Authentication functional unit by the sending ACPM is implicit in the presence of the mechanism-name or calling-authentication-value fields.

7.1.4.17 User-information

- For the sending ACPM: The value is determined by the value of the User-information parameter of the A-UNIT-DATA request primitive.
- For the receiving ACPM: This value is used to determine the value of the User-information parameter of the A-UNIT-DATA indication primitive.

7.1.5 Collisions and interactions

Overlapping attempts by two requesters to send AUDTs results in the communication of both data units.

7.2 Rules for extensibility

When processing an incoming AUDT, the receiving ACPM shall:

a) ignore all tagged values that are not defined in the abstract syntax definition of this Recommendation | International Standard; and

b) ignore all unknown bit name assignments within a bit string;

c) if the Authentication functional unit is not supported, ignore any mechanism-name or calling-authentication-value field.

8 Mapping to the supporting service

This clause defines the service primitives invoked by the ACSE protocol entity to pass the ACSE APDUs to and to request services from the supporting service. In general, the supporting service for ACSE will be either the presentation service or ACSE. However, any ASE Service Definition that is compatible with this definition, and can be used without perturbing the behaviour of the communicating ACSE protocol machines, can be used to provide the supporting service.

8.1 IA-UNIT-DATA.submit

8.1.1 When Invoked

This primitive is invoked in response to an A-UNIT-DATA request primitive.

8.1.2 Action upon Receipt

When this primitive is invoked, the User-information may be mapped to either a connection-mode or connectionless-mode supporting service. The ACPM uses the naming fields provided in the A-UNIT-DATA request to determine the naming fields specified in the naming parameters of the IA-UNIT-DATA.submit.

8.2 IA-UNIT-DATA.deliver

8.2.1 When Invoked

This primitive is invoked by the supporting service to deliver an AUDT APDU.

8.2.2 Action upon Receipt

When this primitive is invoked, the A-UNIT-DATA APDU is delivered and processed by the ACSE protocol machine. If the parameters of the AUDT are acceptable, the User-information is delivered to the ASOI indicated by the naming fields.

8.2.3 IA-UNIT-DATA Parameters

The parameters of the IA-UNIT-DATA primitives have the same semantics as the parameters of the A-UNIT-DATA primitives.

9 Abstract Syntax Definition of APDUs

9.1 The abstract syntax of each of the ACSE APDUs is specified in this clause using ASN.1 (see ITU-T Rec. X.680 | ISO/IEC 8824-1).

```
Connectionless-ACSE-1 {joint-iso-itu-t association-control(2) module(2) clacse1(2) version(1)}
DEFINITIONS ::=
BEGIN
-- Connectionless-ACSE-2 refers to ITU-T Rec. X.237 bis | ISO/IEC 15955.

IMPORTS
        AP-title, AE-qualifier, AE-title, Authentication-value, Mechanism-name, ObjectSet
    FROM ACSE-1
    { joint-iso-itu-t association-control(2) modules(0) acse1(1) version1(1)};

-- The data types AP-title and AE-qualifier are imported from ITU-T Rec. X.227 bis | ISO/IEC 15954.

AUDT-apdu ::= [APPLICATION 0] IMPLICIT SEQUENCE
{ protocol-version              [0]     IMPLICIT BIT STRING
                                { version1 (0) }    DEFAULT {version1},
aSO-context                     [1]     ASO-context-name            OPTIONAL,
called-AP-title                 [2]     AP-title                    OPTIONAL,
called-AE-qualifier             [3]     AE-qualifier                OPTIONAL,
called-AP-invocation-id         [4]     AP-invocation-id            OPTIONAL,
called-AE-invocation-id         [5]     AE-invocation-id            OPTIONAL,
calling-AP-title                [6]     AP-title                    OPTIONAL,
calling-AE-qualifier            [7]     AE-qualifier                OPTIONAL,
calling-AP-invocation-id        [8]     AP-invocation-id            OPTIONAL,
calling-AE-invocation-id        [9]     AE-invocation-id            OPTIONAL,

-- The following field shall only be used if the Authentication functional unit is selected.

mechanism-name                  [11]    IMPLICIT Mechanism-name     OPTIONAL,

-- The following field shall only be used if the Authentication functional unit is selected.

calling-authentication-value    [12]    EXPLICIT Authentication-value   OPTIONAL,
p-context                       [14]    IMPLICIT Default-P-context      OPTIONAL,
implementation-information      [29]    IMPLICIT GraphicString          OPTIONAL,
...,
...,
user-information                [30]    IMPLICIT SEQUENCE SIZE (1, ..., 0|2..MAX)
                                                OF EXTERNAL
}
ASO-context-name ::= OBJECT IDENTIFIER
Application-context-name ::= ASO-context-name

-- As defined in ITU-T Rec. X.650 | ISO/IEC 7498-3, an application-entity title
-- is composed of an application-process title and
-- an application-entity qualifier. The ACSE protocol provides for the transfer of an
-- application-entity title value
-- by the transfer of its component values.

AE-invocation-id ::= INTEGER
AP-invocation-id ::= INTEGER
Default-P-context ::= SEQUENCE { abstract-syntax [0] IMPLICIT Abstract-syntax-name OPTIONAL,
        transfer-syntax [1] IMPLICIT Transfer-syntax-name}
Abstract-syntax-name ::= OBJECT IDENTIFIER
Transfer-syntax-name ::= OBJECT IDENTIFIER
END
```

9.2 The following name, that has the ASN.1 type of OBJECT IDENTIFIER, applies to the connectionless ACSE abstract syntax definition specified in this subclause:

{ joint-iso-itu-t association-control(2) abstract-syntax(1) clapdu(1) version(1) }

9.3 The set of encoding rules named:

{ joint-iso-itu-t asn1(1) basic-encoding(1) }

and specified in CCITT Rec. X.209 | ISO/IEC 8825 is applicable to the connectionless ACSE abstract syntax definition.

9.4 User-information encoding rules can embed PDV-list as a SEQUENCE OF EXTERNAL for use with A-DATA of the connection-mode ACSE protocol.

10 Conformance

A system claiming to implement the procedures specified in this Recommendation | International Standard shall comply with the requirements in 10.1 through 10.3.

10.1 Statement requirements

The following shall be stated by the implementor:

a) whether the system is capable of acting in the role of A-UNIT-DATA requestor or acceptor, or both;

b) that the system supports this protocol.

NOTE – A PICS (Protocol Implementation Conformance Statement) for this Recommendation | International Standard is contained in ITU-T Rec. X.257 | ISO/IEC 10035-2.

10.2 Static requirements

The system shall:

a) act in the role of a requestor (by sending an AUDT APDU) or acceptor (by receiving an AUDT APDU), or both;

b) support (as a minimum) the encoding which results from applying the basic ASN.1 encoding rules to the ASN.1 specified in clause 9 for the purpose of communicating ACSE APCI.

10.3 Dynamic requirements

The system shall follow all the procedures specified in clause 7 (including the rules for extensibility) and Annex A.

11 Precedence

Any person encountering an inaccuracy or ambiguity in this Recommendation | International Standard is requested to notify the ITU-T Secretariat or the ISO/IEC Secretariat without delay in order that the matter may be investigated and appropriate action taken.

Annex A

State table

(This annex forms an integral part of this Recommendation | International Standard)

A.1 General

A.1.1 This annex defines the state table for the A-UNIT-DATA protocol.

A.1.2 The ACPM state table does not constitute a formal definition of the ACPM. It is included to provide a more precise specification of the elements of procedure defined in clause 7.

A.1.3 This annex contains the following tables:

a) Table A.1 specifies the abbreviated name, source, and name/description of each incoming event. The sources are:

   1) ACSE service-user (AC-user); and

   2) peer ACPM (AC-peer).

b) Table A.2 specifies the abbreviated name, target, and name/description of each outgoing event. The targets are:

   1) ACSE service-user (AC-user); and

   2) peer ACPM (AC-peer).

c) Table A.3 specifies the ACPM state table using the abbreviations of the above tables.

A.2 Conventions

A.2.1 The intersection of an incoming event (row) and a state (column) forms a cell.

A.2.2 A non-blank cell represents an incoming event and state that is defined. Such a cell contains one or more action lists. An action list may be either mandatory or conditional. If a cell contains a mandatory action list, it is the only action list in the cell.

A.2.3 An action list contains:

a) an outgoing event; and

b) a resultant state.

A.3 Actions to be taken by the ACPM

The ACPM state table defines the action to be taken by the ACPM in terms of an outgoing event and the resultant state of the ACPM.

A.4 Relationship to Presentation and other ASEs

The ACPM state table (see Table A.3) only defines the interactions of the ACPM, its ACSE service-user and the supporting services used by the ACPM.

NOTE – The occurrence of other events from the supporting service or other application-service-elements is not included in the ACPM state table because they do not affect the ACPM.

Table A.1 – Incoming event list

Abbreviated name	Source	Name and description
A-UNIT-DATAreq	AC-user	A-UNIT-DATA request primitive
AUDT[a)]	AC-peer	A-UNIT-DATA APDU
[a)] The AUDT is User data on an IA-UNIT-DATA.deliver		