

INTERNATIONAL
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**Information technology — Open Systems
Interconnection — Service definition for
the Association Control Service Element**

iTeh STANDARD PREVIEW

*Technologies de l'information — Interconnexion de systèmes ouverts
(OSI) — Définition du service pour l'élément de service de contrôle
d'association*

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Contents

	<i>Page</i>
1 Scope	1
2 Normative references	1
2.1 Identical Recommendations International Standards	1
2.2 Paired Recommendations International Standards equivalent in technical content	2
2.3 Additional references	2
3 Definitions	2
3.1 Reference model definitions	2
3.1.1 Basic Reference Model definitions	2
3.1.2 Security architecture definitions	3
3.1.3 Naming and addressing definitions	3
3.2 Service conventions definitions	3
3.3 Presentation service definitions	3
3.4 Application Layer Structure definitions	4
3.5 ACSE service definitions	4
4 Abbreviations	4
5 Conventions	5
6 Basic concepts	5
6.1 General	5
6.2 Authentication	6
6.2.1 Authentication concepts	6
6.2.2 ACSE authentication facilities	6
7 Service overview	7
7.1 Connection-oriented mode	7
7.1.1 ACSE services	7
7.1.2 Functional units	8
7.2 Connectionless mode	8
8 Relationship with other ASEs and lower layer services	8
8.1 Other application-service-elements	8
8.2 Presentation-service	8
8.2.1 Connection-oriented mode	8
8.2.2 Connectionless mode	10
8.3 Session-service	10
8.3.1 Connection-oriented mode	10
8.3.2 Connectionless mode	10

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9	Service definition	10
9.1	A-ASSOCIATE service	10
9.1.1	A-ASSOCIATE parameters	10
9.1.2	A-ASSOCIATE service procedure	15
9.2	A-RELEASE service	15
9.2.1	A-RELEASE parameters	15
9.2.2	A-RELEASE service procedure	16
9.3	A-ABORT service	17
9.3.1	A-ABORT parameters	17
9.3.2	A-ABORT service procedure	17
9.4	A-P-ABORT service	18
9.4.1	A-P-ABORT parameter	18
9.4.2	A-P-ABORT service procedure	18
9.5	A-UNIT-DATA service	18
9.5.1	A-UNIT-DATA Parameters	18
9.5.2	A-UNIT-DATA procedure	19
10	Sequencing information	19
10.1	A-ASSOCIATE	20
10.1.1	Type of service	20
10.1.2	Usage restrictions	20
10.1.3	Disrupted service procedures	20
10.1.4	Disrupting service procedures	20
10.1.5	Collisions	20
10.2	A-RELEASE	20
10.2.1	Type of service	20
10.2.2	Usage restrictions	20
10.2.3	Disrupted service procedures	20
10.2.4	Disrupting service procedures	20
10.2.5	Collisions	20
10.2.6	Further sequencing information	20
10.3	A-ABORT	20
10.3.1	Type of service	20
10.3.2	Usage restrictions	20
10.3.3	Disrupted service procedures	21
10.3.4	Disrupting service procedures	21
10.3.5	Collisions	21
10.3.6	Further sequencing information	21
10.4	A-P-ABORT	21
10.4.1	Type of service	21
10.4.2	Usage restrictions	21
10.4.3	Disrupted service procedures	21
10.4.4	Disrupting service procedures	21
10.5	A-UNIT-DATA	21
10.5.1	Type of service	21
10.5.2	Usage restrictions	21
10.5.3	Disrupted services	21
10.5.4	Disrupting services	21
10.5.5	Collisions	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.

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.

International Standard ISO/IEC 8649 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 21, *Open Systems Interconnection, data management and open distributed processing*, in collaboration with ITU-T. The identical text is published as ITU-T Recommendation X.217.

ISO/IEC 8649:1996

This second edition cancels and replaces the first edition (ISO 8649:1988), which has been technically revised. It also incorporates Amendment 1:1990, Amendment 2:1991 and Technical Corrigendum 1:1991.

Introduction

This Service Definition is one of a set of Recommendations and International Standards produced to facilitate the interconnection of information processing systems. It is related to other Recommendations and 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 area 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 Recommendations | International Standards, the interconnection of information processing systems:

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

This Service Definition recognizes that application-processes may wish to communicate with each other for a wide variety of reasons. However, any communication will require the performance of certain services independent of the reasons for communication. The application-service-element defined herein provides such services.

This Service Definition defines services provided by the application-service-element for application-association control: the Association Control Service Element (ACSE). The ACSE provides basic facilities for the control of an application association between two application-entities. The ACSE includes two optional functional units. One functional unit supports the exchange of information in support of authentication during association establishment. The second functional unit supports the negotiation of application context during association establishment. The ACSE services apply to a wide range of application-process communications.

The ACSE services apply to a wide range of application-process communication requirements.

It is recognized that, with respect to ACSE Quality of Services (QOS) described in clause 9, work is still in progress to provide an integrated treatment of QOS across all layers of the OSI Reference Model, and to ensure that the individual treatments in each layer service satisfy overall QOS objectives in a consistent manner. As a consequence, an addendum may be added to this Service Definition at a later time which reflects further QOS developments and integration.

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INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

**INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION –
SERVICE DEFINITION FOR THE ASSOCIATION
CONTROL SERVICE ELEMENT**

1 Scope

This Service Definition defines ACSE services for application-association control in an open systems interconnection environment. ACSE supports two modes of communication service: connection-oriented and connectionless.

The ACSE connection-oriented service is provided by the use of the connection-oriented ACSE protocol (see ITU-T Rec. X.227 | ISO/IEC 8650-1) in conjunction with the connection-oriented presentation-service (see ITU-T Rec. X.216 | ISO/IEC 8822). The ACSE connection-oriented service assumes as a minimum the use of the presentation-service connection-oriented Kernel functional unit.

The ACSE connectionless service (A-UNIT-DATA) is provided by the use of the connectionless ACSE protocol (see ITU-T Rec. X.237 | ISO/IEC 10035-1) in conjunction with the connectionless presentation-service (P-UNIT-DATA).

Three functional units are defined in the ACSE. The mandatory Kernel functional unit is used to establish and release application-associations. The ACSE includes two optional functional units. The optional Authentication functional unit supports the exchange of information in support of authentication during association establishment. It provides additional facilities for exchanging information in support of authentication during association establishment without adding services. The ACSE authentication facilities may be used to support a limited class of authentication methods. The second optional functional unit supports the negotiation of application context during association establishment. The ACSE services apply to a wide range of application-process communications.

This Service Definition does not specify individual implementations or products, nor does it constrain the implementation of entities and interfaces within a computer system.

No requirement is made for conformance to this Service Definition.

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 International Standards are subject to revision, and the 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.216 (1994) | ISO/IEC 8822:1994, *Information technology – Open Systems Interconnection – Presentation service definition.*

- ITU-T Recommendation X.225 (1995) | ISO/IEC 8327-1:1996, *Information technology – Open Systems Interconnection – Connection-oriented Session protocol: Protocol specification.*
- ITU-T Recommendation X.227 (1995) | ISO/IEC 8650-1:1996, *Information technology – Open Systems Interconnection – Connection-oriented protocol for the Association Control Service Element: Protocol specification.*
- ITU-T Recommendation X.237 (1995) | ISO/IEC 10035-1:1995, *Information technology – Open Systems Interconnection – Connectionless protocol for the Association Control Service Element: Protocol specification.*
- 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.*

2.2 Paired Recommendations | International Standards equivalent in technical content

- CCITT Recommendation X.650 (1992), *Open Systems Interconnection (OSI) – Reference Model for naming and addressing.*
ISO 7498-3:1989, *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 3: Naming and addressing.*
- 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.*

2.3 Additional references

- CCITT Recommendation X.410 (1984), *Message Handling Systems: Remote operation and reliable transfer server.*
- ISO 6523:1984, *Data interchange – Structures for the identification of organizations.*

3 Definitions

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

3.1 Reference model definitions

3.1.1 Basic Reference Model definitions

This Service Definition is based on the concepts developed in ITU-T Rec. X.200 | ISO/IEC 7498-1. It makes use of the following terms defined in them:

- a) application-entity;
- b) application-function;
- c) application Layer;
- d) application-process;
- e) application-protocol-control-information;
- f) application-protocol-data-unit;
- g) application-service-element;
- h) connectionless-mode presentation-service;
- i) (N)-connectionless-mode transmission;
- j) (N)-function;
- k) presentation-connection;
- l) presentation-service;
- m) session-connection;
- n) session-protocol; and
- o) session-service.

3.1.2 Security architecture definitions

This Service Definition makes use of the following terms defined in CCITT Rec. X.800 | ISO 7498-2:

- a) credentials;
- b) password; and
- c) peer-entity authentication.

3.1.3 Naming and addressing definitions

This Service Definition makes use of the following terms defined in CCITT Rec. X.650 | ISO 7498-3:

- a) application-process title;
- b) application-entity qualifier;
- c) application-entity title;¹⁾
- d) application-process invocation-identifier;
- e) application-entity invocation-identifier; and
- f) presentation address.

3.2 Service conventions definitions

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

- a) service-provider;
- b) service-user;
- c) confirmed service;
- d) non-confirmed service;
- e) provider-initiated service;
- f) primitive;
- g) request (primitive);
- h) indication (primitive);
- i) response (primitive), and
- j) confirm (primitive).

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3.3 Presentation service definitions

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

- a) abstract syntax;
- b) abstract syntax name;
- c) connectionless-mode (presentation);
- d) default context;
- e) defined context set;
- f) functional unit (presentation);
- g) normal mode (presentation);
- h) presentation context;
- i) presentation data value; and
- j) X.410-1984 mode (presentation).

¹⁾ As defined in CCITT Rec. X.650 | ISO 7498-3, an application-entity title is composed of an application-process title and an application-entity qualifier. The ACSE service provides for the transfer of an application-entity title value by the transfer of its component values.

3.4 Application Layer Structure definitions

This Service Definition makes use of the following terms defined in ISO/IEC 9545:

- a) application-context;
- b) application-entity invocation;
- c) control function; and
- d) application-service object.

3.5 ACSE service definitions

For the purposes of this Service Definition, the following definitions apply:

3.5.1 application-association; association: A cooperative relationship among application-entity invocations which enables the communication of information and the coordination of their joint operation for an instance of communication. This relationship may be formed by the transfer of application-protocol-control-information using the presentation service.

3.5.2 Association Control Service Element: The particular application-service-element defined in this Service Definition.

3.5.3 ACSE service-user: The part of the application-entity that makes use of ACSE services.

3.5.4 ACSE service-provider: An abstraction of the totality of those entities which provide ACSE services to peer ACSE service-users.

3.5.5 requestor: The ACSE service-user that issues the request primitive for a particular ACSE service. For a confirmed service, it also receives the confirm primitive.

3.5.6 acceptor: The ACSE service-user that receives the indication primitive for a particular ACSE service. For a confirmed service, it also issues the response primitive.

3.5.7 association-initiator: The ACSE service-user that initiates a particular association, i.e. the requestor of the A-ASSOCIATE service that establishes the association.

3.5.8 association-responder: The ACSE service-user that is not the initiator of a particular association, i.e. the acceptor of the A-ASSOCIATE service that establishes the association.

3.5.9 authentication: The corroboration of the identity of objects relevant to the establishment of an association. For example, these can include the AEs, APs, and the human users of applications.

NOTE – This term has been defined to make it clear that a wider scope of authentication is being addressed than is covered by peer-entity authentication in CCITT Rec. X.800 | ISO 7498-2.

3.5.10 authentication-function: An application-function within an application-entity invocation that processes and exchanges authentication-values with a peer authentication-function.

3.5.11 authentication-value: The output from an authentication-function to be transferred to a peer ACSE service-user for input to the peer's authentication-function.

3.5.12 authentication-mechanism: The specification of a specific set of authentication-function rules for defining, processing, and transferring authentication-values.

3.5.13 normal mode: The mode of ACSE operation that results in the transfer of ACSE semantics, using the presentation-service.

3.5.14 X.410-1984 mode: The mode of ACSE operation that allows ACSE service-users to interwork using the protocol specified in Recommendation X.410, 1984 version. The use of this mode results in no transfer of ACSE semantics.

3.5.15 disrupt: A service procedure is disrupted by another service procedure if the second service results in service primitives not being used as specified for the procedure of the first service.

4 Abbreviations

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

ACSE	Association Control Service Element
AE	application-entity

AEI	application-entity invocation
AP	Application process
ASE	application-service-element
CF	Control function
cnf	confirm primitive
ind	indication primitive
OSI	Open Systems Interconnection
QOS	Quality of Service
req	request primitive

5 Conventions

This Service Definition defines services for the ACSE following the descriptive conventions defined in ITU-T Rec. X.210 | ISO/IEC 10731. In clause 9, the definition of each ACSE service includes a table that lists the parameters of its primitives. For a given primitive, the presence of each parameter is described by one of the following values:

Blank	Not applicable
C	Conditional
M	Mandatory
P	Subject to conditions defined in ITU-T Rec. X.216 ISO/IEC 8822
U	User option

In addition, the notation (=) indicates that a parameter value is semantically equal to the value to its left in the table.

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6 Basic concepts

6.1 General

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The reference model (see ITU-T Rec. X.200 | ISO/IEC 7498-1) represents communication between a pair of application-processes (APs) in terms of communication between their application-entities (AEs) using the presentation-service. The functionality of an AE is factored into a number of application-service-elements (ASEs). The interaction between AEs is described in terms of the use of their ASEs' services.

This Service Definition supports the modeling concepts of application-association and application context.

An **application-association** is a cooperative relationship between two AEIs. It provides the necessary frame of reference between the AEIs in order that they may interwork effectively. This relationship is formed by the communication of application-protocol-control-information between the AEIs through their use of the presentation-service.

An **application context** is an explicitly identified set of application-service-elements, related options and any other necessary information for the interworking of application-entities on an application association (see ISO/IEC 9545).

The ACSE is modeled an ASE. The primary purpose of ACSE is to establish and release an application-association between two AEIs and to determine the application context of that association. The ACSE supports two modes of communication: connection-oriented and connectionless. For the connection-oriented mode, the application-association is established and released by the reference of ACSE connection-oriented services (see 7.1). For the connectionless mode, the application-association exists during the invocation of the single ACSE connectionless mode service, A-UNIT-DATA (see 7.2).

The ACSE service-user is that part of an application-entity that makes use of ACSE services. It may be the Control Function (CF) or an ASE or some combination of the two.

A referencing specification does not need to specify the use of ACSE service primitive parameters that are not relevant to its operation. Such parameters may be passed by the CF between the ACSE service-provider and that part of the AEI to which the parameters are relevant.

As an example, consider the authentication parameters of the Authentication functional unit discussed below in 6.2. The CF may be used to model the passing of authentication-values between the authentication-function and the ACSE service-provider. An ASE that references ACSE need not be concerned with these parameters.