



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

X.227

Amendment 1

(10/96)

SERIES X: DATA NETWORKS AND OPEN SYSTEM
COMMUNICATION

Open System Interconnection – Connection-mode
protocol specifications

Information technology – Open Systems
Interconnection – Connection-oriented protocol for
the association control service element: Protocol
specification

**Amendment 1: Incorporation of extensibility
markers**

ITU-T Recommendation X.227 – Amendment 1

(Previously CCITT Recommendation)

ITU-T X-SERIES RECOMMENDATIONS
DATA NETWORKS AND OPEN SYSTEM COMMUNICATION

PUBLIC DATA NETWORKS	X.1–X.199
Services and facilities	X.1–X.19
Interfaces	X.20–X.49
Transmission, signalling and switching	X.50–X.89
Network aspects	X.90–X.149
Maintenance	X.150–X.179
Administrative arrangements	X.180–X.199
OPEN SYSTEM INTERCONNECTION	X.200–X.299
Model and notation	X.200–X.209
Service definitions	X.210–X.219
Connection-mode protocol specifications	X.220–X.229
Connectionless-mode protocol specifications	X.230–X.239
PICS proformas	X.240–X.259
Protocol Identification	X.260–X.269
Security Protocols	X.270–X.279
Layer Managed Objects	X.280–X.289
Conformance testing	X.290–X.299
INTERWORKING BETWEEN NETWORKS	X.300–X.399
General	X.300–X.349
Satellite data transmission systems	X.350–X.399
MESSAGE HANDLING SYSTEMS	X.400–X.499
DIRECTORY	X.500–X.599
OSI NETWORKING AND SYSTEM ASPECTS	X.600–X.699
Networking	X.600–X.629
Efficiency	X.630–X.649
Naming, Addressing and Registration	X.650–X.679
Abstract Syntax Notation One (ASN.1)	X.680–X.699
OSI MANAGEMENT	X.700–X.799
Systems Management framework and architecture	X.700–X.709
Management Communication Service and Protocol	X.710–X.719
Structure of Management Information	X.720–X.729
Management functions	X.730–X.799
SECURITY	X.800–X.849
OSI APPLICATIONS	X.850–X.899
Commitment, Concurrency and Recovery	X.850–X.859
Transaction processing	X.860–X.879
Remote operations	X.880–X.899
OPEN DISTRIBUTED PROCESSING	X.900–X.999

For further details, please refer to ITU-T List of Recommendations.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. Some 179 member countries, 84 telecom operating entities, 145 scientific and industrial organizations and 38 international organizations participate in ITU-T which is the body which sets world telecommunications standards (Recommendations).

The approval of Recommendations by the Members of ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, 1993). In addition, the World Telecommunication Standardization Conference (WTSC), which meets every four years, approves Recommendations submitted to it and establishes the study programme for the following period.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC. The text of ITU-T Recommendation X.227, Amendment 1, was approved on 5th of October 1996. The identical text is also published as ISO/IEC International Standard 8650-1.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized private operating agency.

© ITU 1997

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the ITU.

CONTENTS

	<i>Page</i>
1) Subclause 2.1	1
2) Subclause 9.1	1

Summary

This amendment to the connection-oriented ACSE protocol specification includes the ASN.1 extensibility marker in the module describing the protocol.

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

**INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION –
CONNECTION-ORIENTED PROTOCOL FOR THE ASSOCIATION CONTROL
SERVICE ELEMENT: PROTOCOL SPECIFICATION**

**AMENDMENT 1
Incorporation of extensibility markers**

1) Subclause 2.1

Add the following reference.

- ITU-T Recommendation X.501 (1993) | ISO/IEC 9594-2:1995, *Information Technology – Open Systems Interconnection – The Directory: Models.*

2) Subclause 9.1

Replace the ASN.1 module with the following:

```

ACSE-1 { joint-iso-itu-t association-control(2) modules(0) apdus(0) version1(1) }
-- ACSE-1 refers to ACSE version 1

DEFINITIONS ::=

BEGIN

EXPORTS
    acse-as-id, ACSE-apdu,
    aCSE-id, Application-context-name,
    AP-title, AE-qualifier,
    AE-title, AP-invocation-identifier,
    AE-invocation-identifier,
    Mechanism-name, Authentication-value,
    ACSE-requirements;

IMPORTS Name, RelativeDistinguishedName
    FROM InformationFramework
    { joint-iso-ccitt ds(5) module(1) informationFramework(1) 2 };
-- The data types Name and RelativeDistinguishedName are imported from ISO/IEC 9594-2.
-- object identifier assignments

acse-as-id OBJECT IDENTIFIER ::=
    { joint-iso-itu-t association-control(2) abstract-syntax(1) apdus(0) version1(1) }
-- may be used to reference the abstract syntax of the ACSE APDUs

aCSE-id OBJECT IDENTIFIER ::=
    { joint-iso-itu-t association-control(2) ase-id(3) acse-ase(1) version(1) }
-- may be used to identify the Association Control ASE.

```

-- top level CHOICE

ACSE-apdu ::= CHOICE

```
{
  aarq AARQ-apdu,
  aare AARE-apdu,
  rlrq RLRQ-apdu,
  rlre RLRE-apdu,
  abrt ABRT-apdu,
  ...
}
```

AARQ-apdu ::= [APPLICATION 0] IMPLICIT SEQUENCE

```
{ protocol-version [0] IMPLICIT BIT STRING { version1 (0)
  DEFAULT { version1 },

  application-context-name [1] Application-context-name,
  called-AP-title [2] AP-title OPTIONAL,
  called-AE-qualifier [3] AE-qualifier OPTIONAL,
  called-AP-invocation-identifier [4] AP-invocation-identifier OPTIONAL,
  called-AE-invocation-identifier [5] AE-invocation-identifier OPTIONAL,
  calling-AP-title [6] AP-title OPTIONAL,
  calling-AE-qualifier [7] AE-qualifier OPTIONAL,
  calling-AP-invocation-identifier [8] AP-invocation-identifier OPTIONAL,
  calling-AE-invocation-identifier [9] AE-invocation-identifier OPTIONAL,
  -- The following field shall not be present if only the Kernel is used.
  sender-acse-requirements [10] IMPLICIT ACSE-requirements
  OPTIONAL,
  -- The following field shall only be present if the Authentication functional unit is selected.
  mechanism-name [11] IMPLICIT Mechanism-name
  OPTIONAL,
  -- The following field shall only be present if the Authentication functional unit is selected.
  calling-authentication-value [12] EXPLICIT Authentication-value
  OPTIONAL,
  application-context-name-list [13] IMPLICIT Application-context-name-list
  OPTIONAL,
  -- The above field shall only be present if the Application Context Negotiation functional unit is selected
  implementation-information [29] IMPLICIT Implementation-data
  OPTIONAL,
  ..., ...,
  user-information [30] IMPLICIT Association-information
  OPTIONAL
}
```

AARE-apdu ::= [APPLICATION 1] IMPLICIT SEQUENCE

```
{ protocol-version [0] IMPLICIT BIT STRING { version1 (0)
  DEFAULT { version1 },

  application-context-name [1] Application-context-name,
  result [2] Associate-result,
  result-source-diagnostic [3] Associate-source-diagnostic,
  responding-AP-title [4] AP-title OPTIONAL,
  responding-AE-qualifier [5] AE-qualifier OPTIONAL,
  responding-AP-invocation-identifier [6] AP-invocation-identifier OPTIONAL,
  responding-AE-invocation-identifier [7] AE-invocation-identifier OPTIONAL,
  -- The following field shall not be present if only the Kernel is used.
  responder-acse-requirements [8] IMPLICIT ACSE-requirements
  OPTIONAL,
  -- The following field shall only be present if the Authentication functional unit is selected.
  mechanism-name [9] IMPLICIT Mechanism-name
  OPTIONAL,
  -- This following field shall only be present if the Authentication functional unit is selected.
  responding-authentication-value [10] EXPLICIT Authentication-value
  OPTIONAL,
  application-context-name-list [11] IMPLICIT Application-context-name-list
  OPTIONAL,
  -- The above field shall only be present if the Application Context Negotiation functional unit is selected
  implementation-information [29] IMPLICIT Implementation-data
  OPTIONAL,
  ..., ...,
```



```

    user-information                [30]  IMPLICIT Association-information
                                     OPTIONAL
}

RLRQ-apdu ::= [ APPLICATION 2 ] IMPLICIT SEQUENCE
{ reason                            [0]  IMPLICIT Release-request-reason OPTIONAL,
  ..., ...,
  user-information                    [30]  IMPLICIT Association-information OPTIONAL
}

RLRE-apdu ::= [ APPLICATION 3 ] IMPLICIT SEQUENCE
{ reason                            [0]  IMPLICIT Release-response-reason OPTIONAL,
  ..., ...,
  user-information                    [30]  IMPLICIT Association-information OPTIONAL
}

ABRT-apdu ::= [ APPLICATION 4 ] IMPLICIT SEQUENCE
{ abort-source                       [0]  IMPLICIT ABRT-source,
  abort-diagnostic                    [1]  IMPLICIT ABRT-diagnostic OPTIONAL,
-- This field shall not be present if only the Kernel is used.
  ..., ...,
  user-information                    [30]  IMPLICIT Association-information OPTIONAL
}

ABRT-diagnostic ::= ENUMERATED
{ no-reason-given (1),
  protocol-error (2),
  authentication-mechanism-name-not-recognized (3),
  authentication-mechanism-name-required (4),
  authentication-failure (5),
  authentication-required (6),
  ...
}

ABRT-source ::= INTEGER { acse-service-user (0), acse-service-provider (1) } (0..1, ...)

ACSE-requirements ::= BIT STRING { authentication (0), application-context-negotiation(1) }

Application-context-name-list ::= SEQUENCE OF Application-context-name

Application-context-name ::= OBJECT IDENTIFIER
-- Application-entity title productions follow (not in alphabetical order)

AP-title ::= CHOICE {
    ap-title-form1                    AP-title-form1,
    ap-title-form2                    AP-title-form2,
    ... }

AE-qualifier ::= CHOICE {
    ae-qualifier-form1                AE-qualifier-form1,
    ae-qualifier-form2                AE-qualifier-form2,
    ... }

-- When both AP-title and AE-qualifier data values are present in an AARQ or AARE APDU, both must
-- have the same form to allow the construction of an AE-title as discussed in CCITT Rec. X.665 |
-- ISO/IEC 9834-6.

AP-title-form1 ::= Name
-- The value assigned to AP-title-form1 is The Directory Name of an application-process title.

AE-qualifier-form1 ::= RelativeDistinguishedName
-- The value assigned to AE-qualifier-form1 is the relative distinguished name of a particular
-- application-entity of the application-process identified by AP-title-form1.

AP-title-form2 ::= OBJECT IDENTIFIER

AE-qualifier-form2 ::= INTEGER

AE-title ::= CHOICE {
    ae-title-form1                    AE-title-form1,
    ae-title-form2                    AE-title-form2,
    ... }

```

-- 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 protocol provides for the transfer of an
 -- application-entity title value by the transfer of its component values. However, the following data type
 -- is provided for International Standards that reference a single syntactic structure for AE titles.

AE-title-form1 ::= Name

-- For access to The Directory (ITU-T Rec. X.500-Series / ISO/IEC 9594), an AE title has AE-title-form1.
 -- This value can be constructed from AP-title-form1 and AE-qualifier-form1 values contained in an
 -- AARQ or AARE APDU. A discussion of forming an AE-title-form1 from AP-title-form1 and AE-qualifier-
 -- form1 may be found in CCITT Rec. X.665 / ISO/IEC 9834-6.

AE-title-form2 ::= OBJECT IDENTIFIER

-- A discussion of forming an AE-title-form2 from AP-title-form2 and AE-qualifier-form2 may be
 -- found in CCITT Rec. X.665 / ISO/IEC 9834-6.

AE-invocation-identifier ::= INTEGER

AP-invocation-identifier ::= INTEGER

-- End of Application-entity title productions

Associate-result ::= INTEGER

{ accepted (0),
 rejected-permanent (1),
 rejected-transient (2)
 } (0..2, ...)

Associate-source-diagnostic ::= CHOICE

<pre> { acse-service-user </pre>	<pre> [1] INTEGER { null (0), no-reason-given (1), application-context-name-not-supported (2), calling-AP-title-not-recognized (3), calling-AP-invocation-identifier-not-recognized (4), calling-AE-qualifier-not-recognized (5), calling-AE-invocation-identifier-not-recognized (6), called-AP-title-not-recognized (7), called-AP-invocation-identifier-not-recognized (8), called-AE-qualifier-not-recognized (9), called-AE-invocation-identifier-not-recognized (10), authentication-mechanism-name-not-recognized (11), authentication-mechanism-name-required (12), authentication-failure (13), authentication-required (14) } (0..14 , ...), [2] INTEGER { null (0), no-reason-given (1), no-common-acse-version (2) } (0..2 , ...) </pre>
<pre> acse-service-provider </pre>	
<pre> } </pre>	

Association-information ::= SEQUENCE SIZE (1, ..., 0 | 2..MAX) OF EXTERNAL

Authentication-value ::= CHOICE

```

{ charstring [0] IMPLICIT GraphicString,
bitstring [1] IMPLICIT BIT STRING,
external [2] IMPLICIT EXTERNAL,
other [3] IMPLICIT SEQUENCE {
other-mechanism-name MECHANISM-NAME.&id ({ObjectSet}),
other-mechanism-value MECHANISM-NAME.&Type ({ObjectSet}){@.other-mechanism-name}
}
}

```

-- The abstract syntax of (calling/responding) authentication-value is determined by the authentication
 -- mechanism used during association establishment. The authentication mechanism is either explicitly
 -- denoted by the &id field (of type OBJECT IDENTIFIER) for a mechanism belonging to the class
 -- MECHANISM-NAME, or it is known implicitly by
 -- prior agreement between the communicating partners. If the "other" component is chosen, then
 -- the "mechanism-name" component must be present in accordance with
 -- ITU-T Rec. X.680 / ISO/IEC 8824. If the value "mechanism-name" occurs in the AARQ-apdu or the
 -- AARE-apdu, then that value must be the same as the value for "other-mechanism-name"

Implementation-data ::= GraphicString

Mechanism-name ::= OBJECT IDENTIFIER

MECHANISM-NAME ::=TYPE-IDENTIFIER

ObjectSet MECHANISM-NAME ::= {...}

Release-request-reason ::= INTEGER { normal (0), urgent (1), user-defined (30) } (0 | 1 | 30, ...)

Release-response-reason ::= INTEGER { normal (0), not-finished (1), user-defined (30) } (0 | 1 | 30, ...)

END

ITU-T RECOMMENDATIONS SERIES

- Series A Organization of the work of the ITU-T
- Series B Means of expression: definitions, symbols, classification
- Series C General telecommunication statistics
- Series D General tariff principles
- Series E Overall network operation, telephone service, service operation and human factors
- Series F Non-telephone telecommunication services
- Series G Transmission systems and media, digital systems and networks
- Series H Audiovisual and multimedia systems
- Series I Integrated services digital network
- Series J Transmission of television, sound programme and other multimedia signals
- Series K Protection against interference
- Series L Construction, installation and protection of cables and other elements of outside plant
- Series M Maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits
- Series N Maintenance: international sound programme and television transmission circuits
- Series O Specifications of measuring equipment
- Series P Telephone transmission quality, telephone installations, local line networks
- Series Q Switching and signalling
- Series R Telegraph transmission
- Series S Telegraph services terminal equipment
- Series T Terminals for telematic services
- Series U Telegraph switching
- Series V Data communication over the telephone network
- Series X Data networks and open system communication**
- Series Z Programming languages