STD.ISO 9576-1-ENGL 1995 ■ 4851903 0857959 489 ■

INTERNATIONAL STANDARD

ISO/IEC 9576-1

Second edition
1995-12-15

AMENDMENT 1
2000-12-15

Information technology — Open Systems Interconnection — Connectionless Presentation protocol: Protocol specification

AMENDMENT 1: Efficiency enhancements

Technologies de l'information — Interconnexion de systèmes ouverts (OSI) — Protocole de présentation en mode sans connexion: Spécification du protocole

AMENDEMENT 1: Améliorations du rendement

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Reference number
ISO/IEC 9576-1:1995/Amd.1:2000(E)

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Foreword

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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 Amendment may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

Amendment 1 to International Standard ISO/IEC 9576-1:1995 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 Rec. X.236/Amd.1.

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INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – CONNECTIONLESS PRESENTATION PROTOCOL: PROTOCOL SPECIFICATION

AMENDMENT 1
Efficiency enhancements

1) Subclause 2.1

Add the following references by numerical order:

- 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.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.217 (1995)/Amd.2 (1997) | ISO/IEC 8649:1996/Amd.2:1998, *Information technology – Open Systems Interconnection – Service definition for the Association Control Service Element (ACSE) – Amendment 2: Fast-associate mechanism.*
- ITU-T Recommendation X.227 (1995)/Amd.2 (1997) | ISO/IEC 8650-1:1996/Amd.2:1997, *Information technology – Open Systems Interconnection – Connection-oriented protocol for the Association Control Service Element (ACSE): Protocol specification – Amendment 2: Fast-associate mechanism.*
- ITU-T Recommendation X.691 (1997) | ISO/IEC 8825-2:1995, *Information technology – ASN.1 encoding rules: Specification of Packed Encoding Rules (PER).*

2) New subclause 3.5

Add the following new subclause after 3.4:

3.5 Presentation protocol definitions

This Recommendation | International Standard makes use of the following term defined in ITU-T Rec. X.226 | ISO/IEC 8823-1:

3.5.1 Short-encoding protocol option: An option of the presentation protocol that uses efficient encoding of a PPDU containing a single presentation data value.

3) Subclause 4.2

Add the following PPDU at the end of the list:

SHORT-UD PPDU	Short Unit Data PPDU

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4) Subclause 4.3

Add the following abbreviations by alphabetical order:

BER Basic Encoding Rules

PER Packed Encoding Rules

5) New subclause 5.5

Add the following new subclause after 5.4:

5.5 Protocol options

5.5.1 Short encoding protocol option

This protocol option allows use of the Short-encoding form of User-data for any PPDU for which it is defined if the User-data contains only one presentation data value.

This protocol option does not affect the Presentation service. It requires support of the Special User-data parameter of the Session primitive whose User-data is the PPDU.

The use of the short encoding protocol restricts support of the Presentation service and is only available if one of the conditions a), b) or c) is applicable and condition d) applies:

a) The presentation context definition list contains precisely one item in which the abstract syntax name is known to the responding PPM by bilateral agreement.

b) The presentation context definition list is empty and the default context is known by bilateral agreement.

c) The presentation context definition list is empty and the abstract syntax of the default context is specified in ASN.1 and is known to the responding PPM by bilateral agreement.

d) The calling and called presentation selectors are null.

6) Subclause 6.1.1

a) Replace the second sentence with:

For the connectionless-mode protocol, two types of protocol data unit, namely Unit Data PPDU (UD PPDU) and Short Unit Data PPDU (SUD PPDU), are defined.

b) Add the following two new paragraphs at the end of 6.1.1:

If the **short-connect** option is not selected, the PPDU transfer procedure uses the UD PPDU.

If the **short-connect** option is selected, the PPDU transfer procedure uses the SUD PPDU.

7) New subclause 6.1.3

Add the following new subclause after 6.1.2:

6.1.3 SUD PPDU associated parameters

6.1.3.1 Encoding choice.

This shall indicate the transfer syntax to be used for the (single) presentation context (which may be the default context) as follows:

a) transparent encoding (understood by bilateral agreement);

b) Basic Encoding Rules;

c) Packed Encoding Rules (unaligned variant);

d) Packed Encoding Rules (aligned variant).

The transfer syntaxes b), c) or d) apply only if the abstract syntax is specified using ASN.1.

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6.1.3.2 User-data

This shall be the User-data parameter for the P-UNIT-DATA request service primitive.

8) Subclause 6.2

Add the following text immediately after the subclause 6.2 heading:

If the short-encoding option is not selected, the PPDU transfer procedure is described in 6.2.1 and 6.2.2.

9) Subclause 6.2.1

In the second paragraph of 6.2.1, take out the calling-session-address *and the* called-session-address *from the list of parameters of the UD PPDU*

10) New subclauses 6.2.3 and 6.2.4

Add the following two new subclauses after 6.2.2:

6.2.3 Sending a SUD PPDU

When a P-UNIT-DATA request service primitive is received by a PPM (the initiator), and the short-encoding option is to be proposed (thus, one of the conditions a), b), or c) in 5.5.1 applies and condition d) of 5.5.1 applies), the PPM may choose to transfer the user data by sending the SHORT-UNIT-DATA PPDU containing the encoding option selection parameter and user data.

The calling and called address parameters of the P-UNIT-DATA request service primitive are used to determine the calling-session-address and the called-session-address.

When a P-UNIT-DATA request service primitive is received by a PPM, it shall send a SUD PPDU containing the presentation data value.

A S-UNIT-DATA request service primitive is issued with the calling and called session-address parameter, the Quality of Service parameter requested and the SS-user-data containing the SUD PPDU.

6.2.4 Receiving a SUD PPDU

The SUD PPDU arrives in the SS-user-data field of a S-UNIT-DATA indication. The calling-session-address from the S-UNIT-DATA indication and the NIL presentation-selector will be used to determine the calling-presentation-address parameter for the P-UNIT-DATA indication. The called-session-address from the S-UNIT-DATA indication and the NIL presentation-selector will be used to determine the called-presentation-address parameter for the P-UNIT-DATA indication.

If the receiving PPM does not support the short-encoding protocol option and the SHORT-UNIT-DATA PPDU is received as user data on a S-UNIT-DATA indication primitive, it shall discard the PPDU without any notification.

The responding PPM may refuse the proposed data transfer (if, for example, the encoding choice offered on the SHORT-UNIT-DATA PPDU is unacceptable), in which case it shall discard the PPDU without any notification. Alternatively, if not refusing, it shall issue a P-UNIT-DATA indication service primitive.

If the data transfer is accepted, the transfer syntax of the User data belonging to the (single) presentation context (which may be the default context) is set according to the encoding-choice parameter value of the SHORT-UNIT-DATA PPDU.

11) Clause 7

a) *In first line of clause 7, insert subclause number and change title to:*

7.1 Unit data transfer (long form PPDU)

b) *Replace* S-CONNECT *by* S-UNIT-DATA *in item b) of 7.1.*

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12) New subclause 7.2

Add the following new subclause after 7.1:

7.2 Unit data transfer (short form PPDU)

a) SUD PPDU – The SHORT-UNIT-DATA PPDU shall be conveyed from the initiating PPM to the responding PPM in the S-UNIT-DATA request and indication session-service primitives.

b) SUD PPDU associated parameters – Table 4 defines the mapping of the SUD PPDU associated parameters onto S-UNIT-DATA parameters.

Table 4 – Mapping of SUD PPDU associated parameters onto S-UNIT-DATA parameters

SUD PPDU associated parameter	S-UNIT-DATA parameter	m/nm
Encoding-choice User data	SS-User-data SS-User-data	m nm
m Mandatory nm Non-mandatory		

13) Clause 8

Change title of clause 8 to:

8 Structure and encoding of PPDUs

14) Subclause 8.1.2

a) Replace the first sentence in 8.1.2 with:

The structure of SS-user data parameter values except for those in the SHORT-UNIT-DATA PPDU is specified using:

b) Add at the end of 8.1.2:

c) the specification of the short-encoding PPDUs in 8.1.4.

The structure of the SHORT-UNIT-DATA PPDU is specified in 8.1.4.

15) New subclause 8.1.4

Add the following new subclause after 8.1.3:

8.1.4 SHORT-UNIT-DATA PPDU

The protocol control information of the SHORT-UNIT-DATA PPDU shall be one octet, with the two trailing bits consisting of the encoding-choice parameter. This PCI is followed by the User-data parameter (encoded as per the encoding-choice parameter).

The encoding of the SHORT-UNIT-DATA is as shown in the following bit pattern:

0000 00zz

where zz identifies the encoding-choice as follows:

- 00: bilateral agreement;
- 01: BER;
- 10: unaligned PER;
- 11: aligned PER.

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16) Subclause 8.2

Modify subclause 8.2 as follows:

a) *Add to UD-type, just before* user-data:

extensions **[5] SEQUENCE { ... } OPTIONAL,**
-- to allow for future extensions

b) *In the definition of Context-list, change* SEQUENCE OF *to:*

SEQUENCE SIZE (0..7,...,8..MAX) OF

c) *Change the definition of Presentation-context-identifier to:*

Presentation-context-identifier :: = INTEGER (1..127, ..., 128..MAX)

d) *Add extensibility markers, " , ... " at the end of Protocol-version*

e) *Change the definition of Presentation-selector to:*

Presentation-selector ::= OCTET STRING SIZE (1..4,...,0,5..MAX)

f) *In the definition of Fully-encoded-data, change* SEQUENCE OF *to:*

SEQUENCE SIZE (1,...,2..MAX) OF

17) Subclause 8.3.1

Replace subclause 8.3.1 with the following:

8.3.1 Except for type User-data, ASN.1 datatypes specified in 8.2 shall be encoded according to either:

a) the Basic Encoding Rules for ASN.1 (ITU-T Rec. X.690 | ISO/IEC 8825-1); or

b) the Packed Encoding Rules for ASN.1 (ITU-T Rec. X.691 | ISO/IEC 8825-2). If the responder does not support PER, the PER-encoded UD will appear to be a protocol error and the UD PPDU will be discarded without any notification.

18) Subclause 8.3.3

Replace S-CONNECT *by* S-UNIT-DATA.

19) Subclause 8.4.1.3

Replace item b) with the following:

b) Whenever User-data appears as an element of some other ASN.1 type in 8.2, the encoding of the User-data value shall be:

i) if the basic encoding rules have been used to encode the other ASN.1 type, according to the Basic Encoding Rules for ASN.1 (ITU-T Rec. X.690 | ISO/IEC 8825-1); or

ii) if the packed encoding rules have been used to encode the other ASN.1 type, according to the Packed Encoding Rules for ASN.1 (ITU-T Rec. X.691 | ISO/IEC 8825-2).

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20) New subclauses 8.4.2.7 and 8.4.2.8

Add the following two new subclauses after 8.4.2.6:

8.4.2.7 When the packed encoding rules are selected for the encoding of the UD PPDU, Full encoding shall be the application of the Packed Encoding Rules for ASN.1 (ITU-T Rec. X.691 | ISO/IEC 8825-2) to the Fully-encoded-data value. The structure and contents of the presentation-data-values component of a PDV-list value shall be as specified in 8.4.2.8.

8.4.2.8 When the packed encoding rules are selected for the encoding of the UD PPDU, the presentation data values component of a PDV-list value shall be encoded according to the Packed Encoding Rules for ASN.1 (ITU-T Rec. X.691 | ISO/IEC 8825-2). The various options for the presentation-data-values component of the PDV-list value shall be as specified in 8.4.2.4 a), b) and c).

NOTE – The use of the single ASN.1 type applies only to a value encoded according to the Basic Encoding Rules, even if the Presentation PCI is encoded according to the Packed Encoding Rules.

21) Annex A

a) In Table A.1, change the description of the UD incoming event and add a row for the SUD incoming event as follows:

UD SUD	Long-form PPDU short-form PPDU	Long-form Presentation Unit Data Short-form Presentation Unit Data

b) In Table A.2, change the description of the UD outgoing event and add a row for the SUD outgoing event as follows:

UD SUD	Long-form PPDU short-form PPDU	Long-form Presentation Unit Data SPDU; sent as user data on a S-UNIT-DATA request primitive Short-form Presentation Unit Data SPDU; sent as user data on a S-UNIT-DATA request primitive

c) In Table A.3, change the description of P-UNIT-DATAreq event and add a row for the SUD event as follows:

Event \ State	IDLE
P-UNIT-DATAreq	p1 SUD IDLE ¬p1 UD IDLE
SUD	S-UNIT-DATAind IDLE
p1: local choice and SHORT-UNIT-DATA PPDU can be sent in User-data of S-UNIT-DATA request.	

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INTERNATIONAL STANDARD

ISO/IEC 9576-1

Second edition
1995-12-15

Information technology — Open Systems Interconnection — Connectionless Presentation protocol: Protocol specification

Technologies de l'information — Interconnexion de systèmes ouverts — Protocole de présentation en mode sans connexion: Spécification du protocole

Reference number
ISO/IEC 9576-1:1995(E)

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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 9576-1 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.236.

This second edition cancels and replaces the first edition (ISO/IEC 9576:1991), which has been technically revised.

ISO/IEC 9576 consists of the following parts, under the general title *Information technology — Open Systems Interconnection — Connectionless Presentation protocol*:

— *Part 1: Protocol specification*

— *Part 2: Protocol Implementation Conformance Statement (PICS) proforma*

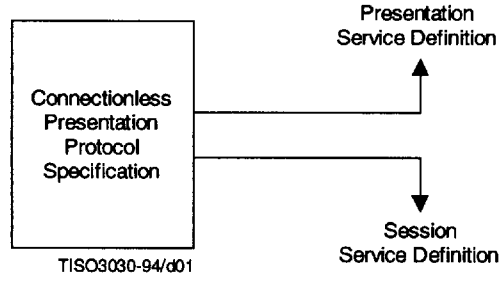
Annex A forms an integral part of this part of ISO/IEC 9576.

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Introduction

This Recommendation | International Standard is one of a set of Recommendations | International Standards produced to facilitate the interconnection of information technology. The set of Recommendations | International Standards covers the services and protocols required to achieve such interconnection.

This Recommendation | International Standard is positioned with respect to other related Recommendations | International Standards in the set by the layers defined in the Reference Model for Open Systems Interconnection (see ITU-T Rec. X.200 | ISO/IEC 7498-1). In particular, it is protocol of the presentation layer. It is most closely related to the Presentation Service Definition (see ITU-T Rec. X.216 | ISO/IEC 8822) and the Session Service Definition (see ITU-T Rec. X.215 | ISO/IEC 8326). The interrelationships of these Recommendations | International Standards are depicted below:



The structure of this Recommendation | International Standard is similar to the structure of the connection-oriented Presentation Protocol specification in order to facilitate cross reference between the two Recommendations | International Standards.

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INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY - OPEN SYSTEMS INTERCONNECTION - CONNECTIONLESS PRESENTATION PROTOCOL: PROTOCOL SPECIFICATION

1 Scope

This Recommendation | International Standard[1)] specifies

a) procedures for the transfer of data and control information from one presentation-entity to a peer presentation-entity;

b) the structure and encoding of the presentation-protocol-data-units used for the transfer of data and control information.

The procedures are defined in terms of

c) the interactions between peer presentation-entities through the exchange of esentation-protocol-data-units;

d) the interactions between a presentation-entity and the presentation-service-user in the same system through the exchange of presentation-service primitives;

e) the interactions between a presentation-entity and the session-service-provider through the exchange of session-service primitives.

These procedures are defined in the main text of this Recommendation | International Standard supplemented by state tables in Annex A.

These procedures are applicable to instances of communication between systems which support the Presentation Layer of the OSI Reference Model and which wish to transfer presentation service data units using connectionless-mode presentation service primitives.

This Recommendation | International Standard also specifies conformance criteria for systems implementing these procedures. It does not contain tests which can be used to demonstrate this 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 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 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.210 (1993) | ISO/IEC 10731:1994, *Information technology – Open Systems Interconnection – Basic Reference Model – Conventions for the definition of OSI services.*

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1) The implementation and use of this Recommendation | International Standard requires the public assignment of values of ASN.1 type OBJECT IDENTIFIER to specifications of abstract syntaxes and transfer syntaxes. Procedures for the naming of abstract syntaxes are contained in ITU-T Rec. X.216 | ISO/IEC 8822. Procedures for the naming of transfer syntaxes are contained in ITU-T Rec. X.226 | ISO/IEC 8823-1.

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- ITU-T Recommendation X.215 (1994) | ISO/IEC 8326:...[2], *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.226 (1994) | ISO/IEC 8823-1:1994, *Information technology – Open Systems Interconnection – Connection-oriented presentation protocol: Protocol specification.*
- ITU-T Recommendation X.256 (1995) | ISO/IEC 9576-2:1995, *Information technology – Open Systems Interconnection – Connectionless presentation protocol: Protocol Implementation Conformance Statement (PICS) proforma.*
- 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.*
- ITU-T Recommendation X.680 (1994) | ISO/IEC 8824-1:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of the basic notation.*
- 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.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).*

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.*

3 Definitions

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 derived from it:

a) Presentation Layer;

b) presentation-protocol-data-unit;

c) presentation-service;

d) presentation-service-access-point;

e) presentation-service-data-unit;

f) presentation-protocol-control-information;

g) Session Layer;

h) session-service-data-unit;

i) session-service-access-point;

j) transfer syntax;

k) (N)-connectionless-mode-transmission.

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3.2 Naming and addressing definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Recommendation X.650 | ISO 7498-3:

a) session-address;

b) presentation-address;

c) presentation-selector.

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 as they apply in the Presentation Layer:

a) service-user;

b) service-provider;

c) service primitive;

d) request;

e) indication;

f) non-confirmed-service.

3.4 Presentation Service definitions

This Recommendation | International Standard is also based on concepts developed in ITU-T Rec. X.216 | ISO/IEC 8822 and makes use of the following terms defined therein:

a) abstract syntax;

b) abstract syntax name;

c) transfer syntax name;

d) presentation data value;

e) presentation context;

f) default context.

4 Abbreviations

4.1 Data Units

PPDU	Presentation Protocol Data Unit
PSDU	Presentation Service Data Unit
SSDU	Session Service Data Unit

4.2 Types of presentation-protocol-data-units

UD PPDU	Unit Data PPDU

4.3 Other abbreviations

ASN.1	Abstract Syntax Notation One (see ITU-T Rec. X.680 | ISO/IEC 8824-1, ITU-T Rec. X.681 | ISO/IEC 8824-2, ITU-T Rec. X.682 | ISO/IEC 8824-3, ITU-T Rec. X.683 | ISO/IEC 8824-4)
PPCI	presentation-protocol-control-information
PPM	presentation protocol machine
PS	presentation-service
PSAP	presentation-service-access-point
PS-user	presentation-service-user
SS	session-service
SSAP	session-service-access-point

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5 Overview of the connectionless presentation protocol

5.1 Service provided by the Presentation Layer

The protocol specified in this Recommendation | International Standard supports the connectionless-mode presentation-service. The connectionless-mode presentation-service is defined in ITU-T Rec. X.216 | ISO/IEC 8822. The connectionless-mode presentation-service primitives are summarized in Table 1.

Table 1 – Presentation Service Primitives

Primitive	Parameters
P-UNIT-DATA request	Calling-presentation-address Called-presentation-address Presentation context definition list Quality of Service User data
P-UNIT-DATA indication	Calling-presentation-address Called-presentation-address Presentation context definition list User data

5.2 Service assumed from the Session Layer

The protocol specified in this Recommendation | International Standard can operate only over the connectionless-mode session-service indicated in Table 2 and defined in ITU-T Rec. X.215 | ISO/IEC 8326.

Table 2 – Session Service Primitives

Primitive	Parameters
S-UNIT-DATA request	Calling-session-address Called-session-address Quality of Service SS-user data
S-UNIT-DATA indication	Calling-session-address Called-session-address SS-user data

5.3 Functions of the Presentation Layer

The functions of the Presentation Layer for connectionless-mode transmission are described in the Reference Model, ITU-T Rec. X.200 | ISO/IEC 7498-1, and are further expanded in the Presentation Service Definition, ITU-T Rec. X.216 | ISO/IEC 8822.

5.4 Model of the Presentation Layer

A presentation-protocol-entity is comprised of one or more presentation protocol machines (PPMs). A PPM may be connection oriented or connectionless. The connectionless-mode PPM communicates with the presentation-service-user through one or more PSAPs by means of the connectionless-mode presentation-service primitives. These presentation-service primitives cause or result from exchange of PPDUs between the peer presentation-entities engaged in connectionless-mode transmission. These protocol exchanges are effected using the services of the Session Layer as defined in the Session Service Definition covering connectionless-mode transmission (see ITU-T Rec. X.215 | ISO/IEC 8326).

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The reception of a service primitive and the generation of dependent actions are considered to be an indivisible action. The reception of a PPDU and the generation of dependent actions are considered to be an indivisible action. The model of the Presentation Layer in connectionless-mode is illustrated in Figure 1.

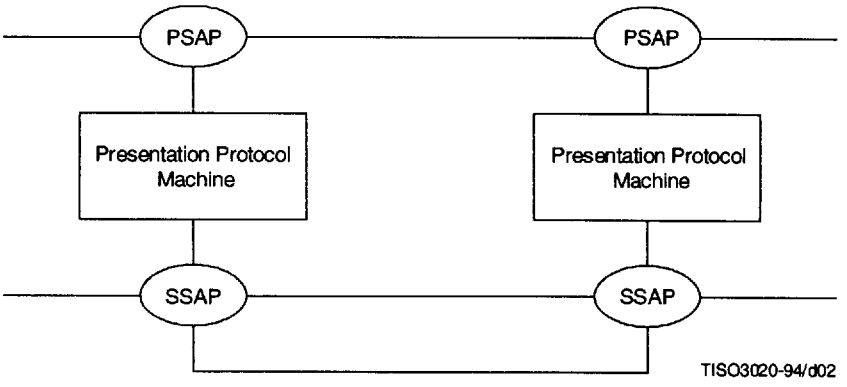


Figure 1 – Model of the Presentation Layer

6 Elements of Procedure

6.1 PPDU transfer

6.1.1 Purpose

The PPDU transfer procedure is used to convey a presentation-protocol-data-unit (PPDU) in a session-service primitive. For the connectionless-mode protocol, only one type of protocol data unit, namely Unit Data PPDU (UD PPDU), is defined.

6.1.2 UD PPDU associated parameters

6.1.2.1 Protocol version

This shall identify the version of the presentation protocol that the sending PPM supports. The version of the protocol defined in this Recommendation | International Standard shall be version-1. Only one protocol version can be proposed by the sending PPM.

6.1.2.2 Presentation context definition list

This shall be a list containing one or more items. Each item represents one item of the Presentation context definition list parameter from the P-UNIT-DATA request service primitive and shall appear as one item of the Presentation context definition list parameter of the P-UNIT-DATA indication service primitive, if issued. Each item contains three components:

- a presentation context identifier;
- an abstract syntax name; and
- a transfer syntax list.

6.1.2.3 Calling-presentation-selector

This shall be the presentation-selector part of the Calling-presentation-address parameter from the P-UNIT-DATA request service primitive and shall appear as the calling-presentation-selector part of the Calling-presentation-address parameter of the P-UNIT-DATA indication service primitive, if issued.

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6.1.2.4 Calling-session-address

This shall be the session-address part of the Calling-presentation-address parameter from the P-UNIT-DATA request service primitive and shall appear as the session-address part of the Calling-presentation-address parameter of the P-UNIT-DATA indication service primitive, if issued.

6.1.2.5 Called-presentation-selector

This shall be the presentation-selector part of the Called-presentation-address parameter from the P-UNIT-DATA request service primitive and shall appear as the called-presentation-selector part of the Called-presentation-address parameter of the P-UNIT-DATA indication service primitive, if issued.

6.1.2.6 Called-session-address

This shall be the session-address part of the Called-presentation address parameter from the P-UNIT-DATA request service primitive and shall appear as the session-address part of the Called-presentation-address parameter of the P-UNIT-DATA indication service primitive, if issued.

6.1.2.7 Quality of Service

This shall be the Quality of Service parameter from the P-UNIT-DATA request service primitive.

6.1.2.8 User data

This shall be the User data parameter from the P-UNIT-DATA request service primitive, and shall appear as the User data parameter of the P-UNIT-DATA indication service primitive, if issued.

If the presentation context definition list parameter is present then the user data shall be a list of presentation data values (including any embedded presentation data values) from presentation contexts defined in the Presentation context list parameter. If the Presentation context definition list parameter is not present, then it shall be a list of presentation data values (including any embedded presentation data values) from the default context.

NOTE – The overall dimensions of the PPDU including presentation user data is determined by limitations imposed by the underlying service provider. The amount of presentation user data which can be supported is therefore influenced by the selection of transfer syntax.

6.2 Procedure

6.2.1 Sending a UD PPDU

The calling and called address parameters of the P-UNIT-DATA request service primitive are used to determine the calling-session-address, calling-presentation-selector, called-session-address and the called-presentation-selector.

When a P-UNIT-DATA request service primitive is received by a PPM, it shall send a UD PPDU containing the calling-session-address, calling-presentation-selector, called-session-address and the called-presentation-selector and the presentation data values.

As a requestor's option, the presentation data values contained in a UD PPDU may be encoded more than once to allow the transfer of the same presentation data values using a number of different transfer syntaxes.

A S-UNIT-DATA request service primitive is issued with the calling and called session-address parameter, the Quality of Service parameter requested and the SS-User-data parameter containing the UD PPDU (UD-type value followed by UDC-type values if present).

The presentation context definition list parameter of the P-UNIT-DATA request primitive is used to determine the presentation context definition list of the UD PPDU.

6.2.2 Receiving a UD PPDU

The UD PPDU (UD-type value followed by UDC-type values if present) arrives in the SS-User-data field of a S-UNIT-DATA indication. The calling-session-address from the S-UNIT-DATA indication and the calling presentation-selector from the UD-type value in the UD PPDU will be used to determine the calling-presentation-address parameter for the P-UNIT-DATA indication. The called-session-address from the S-UNIT-DATA indication and the called presentation-selector from the UD-type value in the UD PPDU will be used to determine the called-presentation-address parameter for the P-UNIT-DATA indication.

The receiving PPM is not required to examine any UDC-type values of UD PPDU. If for any presentation data values received, all its examined encodings are expressed according to transfer syntaxes not supported by the receiving PPM, then the receiving PPM does not issue a P-UNIT-DATA indication.

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In all other cases, it shall issue a P-UNIT-DATA indication with all of the parameters.

The presentation context definition list of the UD PPDU is used to determine the presentation context definition list parameter for the P-UNIT-DATA indication.

7 Mapping of PPDUs onto the session-service

Unit data transfer

a) *UD PPDU* – The UD PPDU shall be conveyed from the initiating PPM to the responding PPM in the S-UNIT-DATA request and indication session-service primitives.

b) *UD PPDU associated parameters* – Table 3 defines the mapping of the UD PPDU associated parameters onto S-CONNECT parameters.

Table 3 – Mapping of UD PPDU associated parameters onto S-UNIT-DATA parameters

UD PPDU associated parameter	S-UNIT-DATA parameter	m/nm/s
Protocol version	SS-user data	nm
Calling-presentation-selector	SS-user data	nm
Calling-session-address	Calling SSAP address	s
Called-presentation-selector	SS-user data	nm
Called-session-address	Called SSAP address	s
Presentation context definition list	SS-user data	nm
Quality of Service	Quality of Service	s
User data	SS-user data	m

m Mandatory
nm Non-mandatory
s As defined in the Session Service Definition (see ITU-T Rec. X.215 | ISO/IEC 8326)

8 Structure and encoding of UD PPDU

8.1 General

8.1.1 The structure of the PPDU shall be defined by:

a) the mapping onto parameters of session-service primitives;

b) the structure of session-service primitive SS-user data parameter values.

8.1.2 The structure of SS-user data parameter values is specified using:

a) the notation ASN.1 (see ITU-T Rec. X.680 | ISO/IEC 8824-1, ITU-T Rec. X.681 | ISO/IEC 8824-2, ITU-T Rec. X.682 | ISO/IEC 8824-3 and ITU-T Rec. X.683 | ISO/IEC 8824-4));

b) additional comments contained in the ASN.1 description.

NOTE – ASN.1 comments in 8.2 are an integral part of this Recommendation | International Standard, and frequently express requirements.

8.1.3 The encoding of SS-user data parameter values is specified in 8.3.

8.2 Structure of SS-user data parameter values

```
ISO9576-CONNECTIONLESS-PRESENTATION DEFINITIONS ::=
BEGIN
--
-- The value of the SS-user data parameter of the S-UNIT-DATA request and indication
-- session-service primitives shall be a UD-type value, followed as a requestor's
-- option by zero or more UDC-type values.
--
```


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```
UD-type ::= SEQUENCE {
        protocol-version      [0]   IMPLICIT Protocol-version DEFAULT {version-1},
        calling-presentation-selector [1] IMPLICIT Calling-presentation-selector OPTIONAL,
        called-presentation-selector [2] IMPLICIT Called-presentation-selector OPTIONAL,
        presentation-context-definition-list [4] IMPLICIT
                                        Presentation-context-definition-list OPTIONAL,
        user-data User-data
}
            -- Shall be the parameters of the UD PPDU.

--
-- As an initiator's option, the presentation data values contained in a UD PPDU may be
-- encoded more than once, using UDC-type values, to allow the transfer of the same
-- presentation data values using a number of different transfer syntaxes.
--

UDC-type ::= User-data
-- Shall not be present if the Presentation context definition list parameter is not present
-- in the UD PPDU. Each instance of this data type shall contain all of the presentation data
-- values which were contained in the User data parameter of the UD PPDU.
-- This shall be the same set of presentation data values which were contained in the UD-type.
--
Abstract-syntax-name ::= OBJECT IDENTIFIER

Called-presentation-selector ::= Presentation-selector

Calling-presentation-selector ::= Presentation-selector

Context-list ::= SEQUENCE OF SEQUENCE {
        presentation-context-identifier Presentation-context-identifier,
        abstract-syntax-name Abstract-syntax-name,
        transfer-syntax-name-list SEQUENCE OF Transfer-syntax-name
}

Presentation-context-definition-list        ::=     Context-list

Presentation-context-identifier ::= INTEGER

Presentation-selector ::= OCTET STRING

Protocol-version ::= BIT STRING { version-1 (0)}

Transfer-syntax-name ::= OBJECT IDENTIFIER

User-data ::= CHOICE {
        simply-encoded-data [APPLICATION 0] IMPLICIT Simply-encoded-data,
        fully-encoded-data [APPLICATION 1]      IMPLICIT Fully-encoded-data
}
-- Subclause 8.4 defines when each of the two alternatives shall be used.

Simply-encoded-data ::= OCTET STRING

-- See 8.4.1.

Fully-encoded-data ::= SEQUENCE OF PDV-list

-- contains one or more PDV-list values.
-- See 8.4.2.

PDV-list ::= SEQUENCE {
        transfer-syntax-name Transfer-syntax-name OPTIONAL,
        presentation-context-identifier Presentation-context-identifier ,
        presentation-data-values CHOICE {
            single-ASN1-type [0] ABSTRACT-SYNTAX.&Type (CONSTRAINED BY {
                -- Type corresponding to presentation context identifier --} ) ,
            octet-aligned [1] IMPLICIT OCTET STRING,
            arbitrary [2]           IMPLICIT BIT STRING
        }
        -- Contains one or more presentation data values from the same
        -- presentation context.
        -- See 8.4.2.
        }
END
```


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8.3 Encoding of SS-user data parameter values

8.3.1 Except for type User-data, ASN.1 datatypes specified in 8.2 shall be encoded according to the Basic Encoding Rules for ASN.1 (see ITU-T Rec. X.690 | ISO/IEC 8825-1).

8.3.2 The encoding of values of type User-data is specified in 8.4.

8.3.3 The encoding of the SS-user data parameter of the S-CONNECT request and indication service primitives shall be the concatenation of the encodings of the UD-type value and the UDC-type values, if any.

8.4 Encoding of values of type User-data

8.4.1 Simple encoding

8.4.1.1 This encoding shall be used when the User-data value is of type Simply-encoded-data.

8.4.1.2 The User-data value shall be of type Simply-encoded-data when the default context is used.

8.4.1.3 Simple encoding shall be as follows:

a) The contents of the Simply-encoded-data value shall be the concatenation of the bitstrings[3)] resulting from the encoding of the presentation data values forming the PS-user data value according to the appropriate transfer syntax.

b) Whenever User-data appears as an element of some other ASN.1 type in 8.2, the encoding of the User-data value shall be according to the Basic Encoding Rules for ASN.1 (see ITU-T Rec. X.690 | ISO/IEC 8825-1).

c) If b) does not apply, the encoding of the User-data value shall be the contents octets of the Simply-encoded-data value (i.e. no identifier octets and no length octets) as specified in a) above.

NOTE – When using simple encoding, the transfer syntax used shall either produce octet-aligned encodings or self-delimiting bitstrings (this is not the general case with transfer syntaxes).

8.4.2 Full encoding

8.4.2.1 This encoding shall be used when the User-data value is of type Fully-encoded-data.

8.4.2.2 The User-data value shall be of type Fully-encoded-data in the UD-type and the UDC-type when the default context is not in use and the presentation context definition list parameter contains more than one entry.

8.4.2.3 Full encoding shall be the application of the Basic Encoding Rules for ASN.1 (see ITU-T Rec. X.690 | ISO/IEC 8825-1) to the Fully-encoded-data value. The structure and contents of the presentation-data-values component of a PDV-list value shall be as specified in 8.4.2.4.

8.4.2.4 The presentation-data-values component of a PDV-list value shall be encoded according to the Basic Encoding Rules for ASN.1 (see ITU-T Rec. X.690 | ISO/IEC 8825-1). The various options for the presentation-data-values component of the PDV-list value shall be used as follows:

a) If the PDV-list value contains exactly one presentation data value which is a single ASN.1 type encoded according to the Basic Encoding Rules for ASN.1 (see ITU-T Rec. X.690 | ISO/IEC 8825-1), then the option "single-ASN1-type" shall be used.

b) If the encodings of the presentation data values contained in the PDV-list value are each an integral number of octets and a) does not apply, then the option "octet-aligned" shall be used. In this case, the contents octets of the OCTET STRING shall be the concatenation of the bitstrings resulting from the encoding of the presentation data values contained in that PDV-list value according to the appropriate transfer syntax.

c) If neither a) nor b) apply, the option "arbitrary" shall be used. The contents octets of the BIT STRING shall be the concatenation of the bitstrings[3)] resulting from the encoding of the presentation data values contained in that PDV-list value according to the appropriate transfer syntax.

8.4.2.5 The Presentation-context-identifier component of a PDV-list value in a UD PPDU shall identify the presentation context of the presentation data values.

---

3) If the transfer syntax is not self-delimiting, then there is a danger that concatenated presentation data values will be ambiguous.

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8.4.2.6 The Transfer-syntax-name component of a PDV-list value in a UD PPDU shall be present when more than one transfer syntax name was proposed for the presentation context of the presentation data values.

9 Conformance

9.1 Dynamic Conformance

A system claiming conformance to this Recommendation | International Standard shall exhibit external behaviour consistent with having implemented:

a) a PPM as defined by clause 6 and Annex A;

b) use of the session-service as defined by clause 7;

c) encoding of PPDUs as defined by clause 8.

9.2 Static Conformance

A system claiming conformance to this International Standard shall be capable of:

a) following all the Connectionless Presentation Layer procedures for the P-UNIT-DATA;

b) support the mapping onto the S-UNIT-DATA service defined in clause 7.

9.3 Protocol implementation conformance statement

The supplier of an implementation which is claimed to conform to this specification shall complete a copy of the PICS proforma provided in ITU-T Rec. X.256 | ISO/IEC 9576-2 and shall provide the information necessary to identify both the supplier and the implementation.

10 Precedence

10.1 The aspects of the protocol for the presentation layer are specified in several clauses in this Recommendation | International Standard. This clause states the rules of precedence for possible situations where the same aspect may be specified in more than one place in an apparently inconsistent manner. The relevant aspects of protocol specification are:

a) mapping to the session-service; and

b) structure and encoding of PPDUs.

10.2 Annex A and clause 6 specify the elements of procedure which govern the behaviour of the presentation protocol. Annex A takes precedence over any other clause in this Recommendation | International Standard which may state or imply contradictory sequencing rules.

10.3 Clause 7 specifies which UD PPDU parameters are carried in which S-UNIT-DATA session service primitives. Clause 7 takes precedence over any other part of this Recommendation | International Standard which may state or imply on what services UD PPDU parameters are carried.

10.4 Clause 8 specifies the structure and encoding of UD PPDU parameters carried in S-UNIT-DATA session service user data parameters. Clause 8 takes precedence over any other part of this Recommendation | International Standard which may state or imply structure and encoding of UD PPDU parameters carried in S-UNIT-DATA session service user data.

NOTE – Any person who, when making use of a Recommendation | International Standard encounters an inaccuracy or ambiguity, is requested to notify their National Member Body of ISO or the Telecommunication Standardization Bureau of the ITU-T without delay in order that the matter may be investigated and appropriate action taken.

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Annex A

State table

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

A.1 General

This annex describes the connectionless presentation protocol in terms of a state table.

Table A.1 specifies the incoming event list.

Table A.2 specifies the outgoing event list.

Table A.3 specifies the state table.

A.2 Convention for entries in the state table

A.2.1 The intersection of a state and an incoming event which is invalid is left blank.

A.2.2 The intersection of a state and an incoming event which is valid contains the resultant state.

Table A.1 – Incoming Event List

Abbreviated Name	Category	Name and description
P-UNIT-DATAreq UD	PS primitive PPDU	P-UNIT-DATA request Presentation Unit Data

Table A.2 – Outgoing Event List

Abbreviated Name	Category	Name and description
P-UNIT-DATAind UD	PS primitive PPDU	P-UNIT-DATA indication Presentation Unit Data; sent as user data on a S-UNIT-DATA request primitive

Table A.3 – Unit Data Transfer

	IDLE
P-UNIT-DATAreq	UD IDLE
UD	P-UNIT-DATAind IDLE

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