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Amendment 1
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SERIES X: DATA NETWORKS AND OPEN SYSTEM COMMUNICATION

Open System Interconnection – Connection-mode protocol specifications

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Information technology – Open Systems Interconnection – Connection-oriented presentation protocol: Protocol specification

Amendment 1: Efficiency enhancements

ITU-T Recommendation X.226 – Amendment 1

(Previously CCITT Recommendation)

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INTERNATIONAL STANDARD 8823-1

ITU-T RECOMMENDATION X.226

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – CONNECTION-ORIENTED PRESENTATION PROTOCOL: PROTOCOL SPECIFICATION

AMENDMENT 1
Efficiency enhancements

Summary

This amendment defines several efficiency options.

The fast associate mechanism defines the construction of the User Summary parameter of the S-CONNECT primitives from the semantics of the presentation CP-PPDU fields.

This amendment describes a protocol option which defines an alternative header encoding for the user-data of most presentation primitives when this contains only one presentation data value. When used in combination with the session short-encoding option, it minimizes the overhead for this common case, without loss of overall function, as the short encoding can be freely mixed with the non-compressed encodings.

The nominated context presentation protocol option allows for the “simple-encoding” CHOICE for the presentation user-data to be used for one of the presentation contexts of the Defined Context Set (DCS) even when there are many elements in the DCS. This allows a significant reduction in the presentation Protocol Control Information (PCI) overhead for any application that sends most of its data in the same presentation context without any loss of functionality.

In another efficiency option, the use of the Packed Encoding Rules (PER) for the presentation protocol allows the full range of values for the presentation protocol to be conveyed with a smaller overhead in terms of the bits to be sent.

Source

The ITU-T Recommendation X.226, Amendment 1 was approved on the 9th of August 1997. The identical text is also published as ISO/IEC International Standard 8823-1.

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. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

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.

NOTE

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

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The ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. The ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, the ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – CONNECTION-ORIENTED PRESENTATION PROTOCOL: PROTOCOL SPECIFICATION

AMENDMENT 1
Efficiency enhancements

1) Subclause 2.1

Add the following references by numerical order:

- ITU-T Recommendation X.691 (1995) | ISO/IEC 8825-2:1995, *Information technology – ASN.1 encoding rules: Specification of Packed Encoding Rules (PER).*
- ITU-T Recommendation X.217 (1995)/Amd.1 (1996) | ISO/IEC 8649:1996/Amd.1:1997, *Information technology – Open Systems Interconnection – Service definition for the Association Control Service Element – Amendment 1: Support of authentication mechanisms for the connectionless mode*.
- ITU-T Recommendation X.227 (1995)/Amd.1 (1996) | ISO/IEC 8650-1:1996/Amd.1:1997, *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.216 (1994)/Amd.1 (1997) | ISO/IEC 8822:1994/Amd.1:1997, *Information technology – Open Systems Interconnection – Presentation service definition – Amendment 1: Efficiency enhancements*.

2) Subclause 2.3

Add the following references by numerical order:

- ITU-T Recommendation X.216 (1994)/Addendum 1 (1995), *Service definition for Presentation layer efficiency enhancements.*
- ITU-T Recommendation X.225 (1995)/Addendum 1 (1995), *Protocol specification for Session layer efficiency enhancements*.

3) Subclause 3.4

Add the following new item at the end of the list:

l) Upper-layer context specification.

Consequently, item k) should have, at the end, a semi-colon instead of a period.

4) Subclause 3.5

Insert the following definition by numerical order:

3.5.3 *bis* nominated context: A member of the Defined Context Set can be nominated by either PPM as its nominated context. There are independent nominated contexts for each direction of communication. There are no nominated contexts unless the nominated context protocol option is selected on the connection. If all the presentation data values in the User-data of PPDU are in the nominated context of the sender, alternative presentation PCI may be used to convey the User-data.

Add the following definitions after 3.5.14:

3.5.15 nominated context protocol option: An option of the presentation protocol that uses an efficient identification of the presentation context of user data when a single presentation data value is present in the user data of a primitive.

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

3.5.17 packed encoding protocol option: An option of the presentation protocol under which the Presentation PPDUs are encoded using the ASN.1 Packed Encoding Rules.

3.5.18 null-encoding protocol option: An option of the presentation protocol, negotiated during connection establishment, that permits a data transfer phase with zero presentation protocol control information.

3.5.19 short-connect protocol option: An option of the presentation protocol that permits an efficient negotiation, during connection establishment, of the null-encoding protocol option.

5) Subclause 4.2

Add the following PPDUs at the end of the list:

SHORT-CP PPDU	Short Connect PPDU
SHORT-CPA PPDU	Short Connect Accept PPDU
SHORT-CPR PPDU	Short Connect Reject PPDU

6) Subclause 4.3

Insert the following abbreviations by alphabetical order:

BER	Basic Encoding Rules
PER	Packed Encoding Rules

7) Subclause 5.4

Insert the following new subclauses after 5.4:

5.4 *bis* Protocol options

Protocol options are elements of procedure defined in the Protocol Specification. Some have no effect on the support of the Presentation Service; others imply restrictions on the support of Presentation Service or can only be used with other options that restrict the service.

The options that do not affect support of the Presentation Service can be negotiated at presentation-connection establishment by the Presentation protocol itself. These include the nominated context, short-encoding and packed encoding options.

The null-encoding option supports a restricted subset of the Presentation Service. It can be negotiated at presentation connection establishment.

The short-connect option can only be used to establish a connection that will use the null-encoding option.

All options apart from short-connect may be negotiated using the fast-associate mechanism (see 6.2.6.9). The short-connect option and the fast-associate mechanism are mutually exclusive. All options may be the subject of *a priori* agreement.

NOTE 1 – The short-encoding and short-connect protocol options are completely separate. Short-encoding applies to the user-data of any PPDU on an established connection. Short-connect applies to the establishment of a connection that will use the null-encoding option.

NOTE 2 – The fast associate mechanism (see 6.2.6.9) is not considered a Presentation protocol option as it is implemented in the Session layer. It can be used to establish a presentation connection that uses any combination of the options, except short-connect.

5.4 *bis*.1 Nominated context protocol option

This protocol option allows each of the protocol machines to choose one of the presentation contexts of the DCS as its nominated context. The nominated context affects the presentation protocol control information that conveys the User-data, in circumstances defined in 8.4. There are independent nominated contexts for each direction – the initiator's nominated context applies to User-data sent by the connection-initiator, the responder's nominated context applies to User-data sent by the connection-responder. Even when the protocol option has been selected, there need not be a nominated context for either or both PPMs.

The nominated context protocol option does not affect the Presentation Service. It has no implications for which session functional units are used.

5.4 *bis*.2 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.

5.4 *bis*.3 Packed encoding rules protocol option

When this protocol option is selected, the PPDUs that are specified in ASN.1 in 8.2 are encoded using the Packed Encoding Rules. When the protocol option is not selected, these PPDUs are encoded using the Basic Encoding Rules. The negotiation of the Packed Encoding Rules protocol option is described in 6.2.6.8.

5.4 *bis*.4 Null-encoding protocol option

When this protocol option is selected, no presentation protocol control information is conveyed over the established presentation connection. In particular, no PPDUs associated with the normal and abnormal release of the connection are conveyed.

The null-encoding protocol option is used on an established connection. The use of the option restricts support of the Presentation service and is only available if one of the following conditions is applicable:

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.

The null-encoding does not require particular Session functional units.

NOTE – It is expected that Presentation null-encoding will typically be used with the Session no-orderly-release functional unit, and with the Session null-encoding option, although this is not required.

5.4 *bis*.5 Short-connect protocol option

The short-connect protocol option is used only in connection establishment to establish a connection on which the null-encoding option will be used, and thus one of the conditions in 5.4 *bis*.4 applies. In addition, it can only be used if both of the following conditions apply:

a) the calling and called presentation selectors are null;

b) the presentation-requirements parameter in the P-CONNECT service includes only the kernel functional unit.

The short-connect protocol option does not require particular Session functional units.

NOTE – It is expected that the Presentation short-connect protocol option will typically be used with the Session short connect mechanism with no upper-layer context identifier present.

8) Subclause 6.2.1

Modify, using the following text, the second paragraph:

The procedure uses the following PPDUs:

If the **short-connect** option is not selected, the connection establishment procedure uses:

a) CP PPDU;

b) CPA PPDU;

c) CPR PPDU.

If the **short-connect** option is selected, the connection establishment procedure uses:

d) SHORT-CP PPDU;

e) SHORT-CPA PPDU;

f) SHORT-CPR PPDU.

9) Subclause 6.2.2

Add the following subclause after 6.2.2.8:

6.2.2.8 *bis* Initiator's nominated context

This shall identify the presentation context from the presentation context definition list that is proposed as the nominated context for the initiating PPM. This parameter shall consist of the presentation context identifier from the appropriate item of the presentation context definition list.

This parameter shall only be present if the nominated context protocol option has been proposed and the presentation context definition list is present.

See also 6.2.6.6.

Add the following subclause after 6.2.2.12:

6.2.2.12 *bis* Protocol options

This shall identify the options of the Presentation protocol selected for use on this connection.

Only options which were proposed in the Protocol options parameter of the CP PPDU shall be selected.

See also 6.2.6.5.

10) Subclause 6.2.3

Add the following subclause after 6.2.3.8:

6.2.3.8 *bis* Responder's nominated context

This shall identify the presentation context from the DCS that shall be the nominated context for the responding PPM. This parameter shall consist of the presentation context identifier for the presentation context being nominated.

This parameter shall only be present if the nominated context protocol option has been selected and the DCS is not empty.

See also 6.2.6.6.

11) Subclause 6.2.2

Add the following subclause after 6.2.2.15:

6.2.2.15 *bis* Protocol options

This shall identify each of the options of the Presentation protocol that the initiating PPM supports and proposes for use on this connection.

The protocol options defined are:

a) nominated context;

b) short-encoding;

c) Packed Encoding Rules;

d) null-encoding.

NOTE – The short-connect protocol option is not represented in this parameter, as the CP PPDU is not used with the short-connect protocol option.

If the parameter is absent, no options are proposed.

See also 6.2.6.5.

12) Subclause 6.2.2.16

Add at the end of the first sentence:

unless the fast-associate mechanism is used, in which case, if the User-data parameter does not appear on the P-CONNECT indication service primitive, the semantic content of the User-data shall be conveyed in the User-Summary parameter.

Consequently, replace the period after the word issued *by a comma.*

Add, after 6.2.2.16, the following subclause:

6.2.2.17 User Summary

This shall be the User Summary parameter from the P-CONNECT request service primitive. If the fast-associate mechanism is used and the User data parameter does not appear on the P-CONNECT indication service primitive, the User Summary parameter shall appear.

13) Subclause 6.2.3.13

Add at the end of the first sentence:

unless the fast-associate mechanism is used, in which case, if the User data parameter does not appear on the P-CONNECT indication service primitive, the semantic content of the User data shall be conveyed in the User Summary parameter.

Consequently, replace the period after the word service *by a comma.*

Add, after 6.2.3.13, the following subclause:

6.2.3.14 User Summary

This shall be the User Summary parameter from the P-CONNECT request service primitive. If the fast-associate mechanism is used and the User data parameter does not appear on the P-CONNECT indication service primitive, the User Summary parameter shall appear.

14) Subclause 6.2.5

Add, immediately following the subclause heading, the following text:

If the null-encoding option is not selected, the connection establishment procedure is described in 6.2.6 through 6.2.7.

15) Subclause 6.2.6

Add, after 6.2.6.4, the following subclauses:

6.2.6.5 Protocol option negotiation

Presentation protocol options are negotiated between the two PPMs.

If the initiating PPM wishes to propose any of the protocol options, it identifies these in the Protocol options parameter of the CP PPDU. If it does not wish to propose any options, there is no Protocol options parameter on the CP PPDU.

In the CPA PPDU, the responding PPM indicates which of the proposed protocol options will be used on the connection. This shall include only options that were proposed on the CP PPDU and are supported by the responding PPM. If none of the options are selected for use on the connection, there is no Protocol options parameter on the CPA PPDU.

NOTE – The earlier editions of this Specification did not define any of the protocol options, or the Protocol options parameter. The rules of extensibility in 8.5 ensure that a responding PPM receiving a CP PPDU proposing options that are not recognized will ignore, and thus negotiate out, option proposals or the entire Protocol options parameter.

6.2.6.6 Nominated context

Each PPM determines which one (if any) of the presentation contexts of DCS shall be its nominated context (which will affect the encoding of User-data in the PPDUs it will send on the presentation connection). The PPM is not required to propose a nominated context, even if the nominated context protocol option is proposed and selected on the connection. If the PPM does not propose a nominated context, it has no nominated context.

The initiating PPM proposes the nominated context that will apply to PPDUs it will send (other than the CP and CPC-type PPDUs) by identifying one of the items in the presentation context definition list. If this presentation context is accepted by the responder in the presentation context result list, and the nominated context protocol option is selected on the connection, the context becomes the initiating PPM's nominated context when the CPA PPDU is received by the initiator. If the presentation context is rejected by the responding PPM or the responding Presentation user, but the connection is accepted, there is no nominated context for the initiating PPM. If the nominated context protocol option is not selected, there is no nominated context for either PPM.

The responding PPM identifies one element of the DCS as its nominated context. This immediately becomes the nominated context for the responding PPM. The nomination of the context applies to the encoding User-data of the CPA PPDU.

6.2.6.7 Short-encoding protocol option

The use of the short-encoding is negotiated between the two PPMs. The protocol option is selected only if both PPMs propose it.

6.2.6.8 Packed encoding rules protocol option

Since use of the Packed encoding rules protocol option can include the encoding of the CP PPDU, negotiation of this protocol option is not always possible. The following mechanisms are available:

a) The use of the Packed encoding rules can be negotiated using the fast-associate mechanism. In this case, the semantics of the CP PPDU are then conveyed by the SS-user summary parameter of S-CONNECT.

b) The CP PPDU can be encoded using BER, but including a protocol options field that offers the PER protocol option. If the responder accepts the option, the CPA and all subsequent PPDUs are encoded using PER. If the responder does not accept the option, all PPDUs are encoded using BER.

NOTE 1 – The encoding rules used for the CPA PPDU can be determined from the high-order three bits of the first octet of the encoded CPA PPDU. For BER, these will be "001" (from the UNIVERSAL tag for SET and the constructed flag). For PER, these bits will be "011" (from the bit map for optional elements and the choice of mode).

c) The CP PPDU is encoded using PER. If the responder does not support the protocol option, the PER-encoded CP will appear to be a protocol error.

NOTE 2 – As the use of the CP PPDU is not negotiated in c), this mechanism is only suitable if it is known *a priori* that the PER protocol option is supported by the responder.

If the responding PPM sends a CPR PPDU (as specified in 6.2.5.5 or 6.2.5.6) the CPR PPDU shall use the same encoding rules as the received CP-type PPDU.

6.2.6.9 Fast-associate mechanism

If the fast associate mechanism is used during connection establishment, the initiating PPM as well as forming a CP PPDU to be passed to the Session service-provider in the User Data parameter of an S-CONNECT request, also passes the semantic content of the CP PPDU in the User Summary parameter of the S-CONNECT request. The User Summary parameter references an Upper-Layer Context specification and is a purely abstract parameter. If the P-CONNECT request User Information parameter was present, the semantic content of this will have been supplied to the PPM in the User Summary parameter of the P-CONNECT request, and is conceptually included in the User Summary parameter of the S-CONNECT request.

If Session provider (via the Session protocol) makes use of the fast associate mechanism, the responding PPM will receive only the User Summary parameter on the S-CONNECT indication, and not the User Data. The responding implementation will reconstruct the semantic content of the CP PPDU that would have been present in the S-CONNECT User-data, and issue a P-CONNECT indication with a User Summary parameter in place of its User data.

Similarly, the responding PPM will form a User Summary parameter on the S-CONNECT response from the CPA PPDU, including the semantic content of the User Summary parameter of the P-CONNECT response (if present) by reference to the same Upper-Layer Context specification. The initiating PPM reconstructs the CPA PPDU.

NOTE – The passing of the User Summary parameters and reconstruction of the PPDUs from the Session User Summary parameters is abstract. There is no requirement for a real implementation to perform these actions.

16) Subclause 6.2.7.2

Amend the first paragraph of 6.2.7.2 as follows:

If the initiating PPM receives an S-P-ABORT indication service primitive or an ARP PPDU**,** or an S-U-ABORT indication service primitive with no SS-user-data parameter, it shall issue a P-P-ABORT indication service primitive and the presentation-connection shall not be established.

17) Subclauses 6.2.8 through 6.2.11

Add the following new subclauses 6.2.8 through 6.2.11, including all subclauses therein, after 6.2.7.2:

6.2.8 SHORT-CPA PPDU associated parameters

6.2.8.1 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.

6.2.8.2 User-data

This shall be the User-data parameter for the P-CONNECT response service primitive.

6.2.9 SHORT-CPR PPDU associated parameters

6.2.9.1 Encoding choice

This shall indicate the transfer syntax 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.

6.2.9.2 Reason

This parameter shall indicate that the rejection is either by the responding presentation service-provider or the responding presentation user. This parameter shall indicate the reason for the rejection of the presentation-connection establishment and shall appear as the Result parameter of the P-CONNECT confirm service primitive. It shall take one of the following values:

– presentation-user;

– reason not specified (transient);

– temporary congestion (transient);

– local limit exceeded (transient);

– called presentation-address unknown (permanent);

– protocol version not supported (permanent);

– default context not supported (permanent);

– user data not readable (permanent).

6.2.9.3 User-data

This shall be the User-data parameter for the P-CONNECT response service primitive.

6.2.10 SHORT-CP PPDU associated parameters

6.2.10.1 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.

6.2.10.2 User-data

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

6.2.11 Connection establishment procedure using the short-connect protocol option

6.2.11.1 When a P-CONNECT request service primitive is received by a PPM (the initiator), and the null-encoding option is to be proposed (thus, one of the conditions in 5.4 *bis*.4 applies) and all of the conditions of 5.4 *bis*.5 apply, the PPM may choose to use the short-connect protocol option. In this case, it shall initiate the establishment of a presentation connection by sending the SHORT-CP PPDU containing the encoding option selection parameter and user data.

6.2.11.2 If the initiating PPM is unable to establish a presentation-connection due to an inability to establish a session-connection, it shall issue a P-CONNECT confirm service primitive with a Result parameter value of "provider-rejection" and the presentation-connection shall not be established.

6.2.11.3 The responding PPM may refuse the proposed presentation-connection (if, for example, the encoding choice offered on the SHORT-CP PPDU is unacceptable), in which case it shall send a SHORT-CPR PPDU with a Reason parameter included (see 6.2.9.2). Alternatively, if not refusing, it shall issue a P-CONNECT indication service primitive.

6.2.11.4 When a P-CONNECT response service primitive is received by a PPM (the responder) with a Result parameter value of "user rejection", it shall refuse the establishment of a presentation connection by sending the SHORT-CPR PPDU. If it receives a P-CONNECT response primitive with a Result parameter value of "acceptance", it shall send a SHORT-CPA PPDU and the presentation-connection shall be established.

6.2.11.5 If the initiating PPM receives a SHORT-CPR PPDU refusing the presentation-connection, then it shall issue a P-CONNECT confirm service primitive with a Result parameter value set based on the encoding of the received Reason parameter, and the presentation-connection shall not be established.

6.2.11.6 If the initiating PPM receives a SHORT-CPA PPDU accepting the presentation-connection, then it shall issue a P-CONNECT confirm service primitive with a Result parameter value of "acceptance", and the presentation-connection shall be established.

6.2.11.7 If the presentation-connection is established, 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-CPA PPDU.

18) Subclauses 6.4.4.2, 6.4.4.3 and 6.4.4.6

Amend text as indicated:

6.4.4.2 Protocol error

When a PPM receives an unrecognized or unexpected PPDU, or an unexpected session-service primitive, it shall issue a P-P-ABORT indication service primitive and, if possible, send an ARP PPDU. If the null encoding protocol option has been selected, then issue an S-U-ABORT request primitive with no SS-user-data parameter. The presentation-connection shall be released.

6.4.4.3 Invalid PPDU

When a PPM receives a PPDU, containing an invalid PPDU parameter value or an unrecognized or unexpected PPDU parameter, including a PPDU with an unexpected presentation context identifier, or one for which the received bitstring does not represent a valid presentation data value (including any embedded presentation data value) in the corresponding abstract syntax, it shall issue a P-P-ABORT indication service primitive and send an ARP PPDU, if possible. If the null-encoding protocol option has been selected, then issue an S-U-ABORT request primitive with no SS-user-data parameter. The presentation-connection shall be released.

6.4.4.6 ARP PPDU

When a PPM receives an ARP PPDU, or an S-U-ABORT indication service primitive with no SS-user-data parameter, it shall issue a P-P-ABORT indication service primitive and the presentation-connection shall be released.

19) Subclause 7.1.1.1

Add at the end of Table 1:

CP-PPDU associated parameter	S-CONNECT parameter	m/nm/s
User summary	SS-User-summary	nm

20) Subclause 7.1.2.1

Add at the end of Table 2:

CPA-PPDU associated parameter	S-CONNECT parameter	m/nm/s
User summary	SS-User-summary	nm

21) Subclauses 7.1.4 through 7.1.6

Add the following new subclauses 7.1.4 through 7.1.6, after 7.1.3.2:

7.1.4 SHORT-CPA PPDU

The SHORT-CPA PPDU shall be conveyed from the responding PPM to the initiating PPM in the S-CONNECT response and confirm primitives when the presentation connection is established.

7.1.4.1 SHORT-CPA PPDU associated parameters

Table 4 *bis* defines the mapping of the SHORT-CPA PPDU associated parameters onto the S-CONNECT parameters.

Table 4 *bis* – Mapping of SHORT-CPA PPDU associated parameters onto S-CONNECT parameters

SHORT-CPA PPDU associated parameter	S-CONNECT parameter	m/nm
Encoding-choice	SS-User-data	m
User data	SS-User-data	nm
m Mandatory nm Non-mandatory		

7.1.4.2 S-CONNECT Result parameter

This parameter shall have the value “accept”.

7.1.5 SHORT-CPR PPDU

The SHORT-CPR PPDU shall be conveyed from the responding PPM to the initiating PPM in the S-CONNECT response and confirm primitives when the presentation-connection is not established.

7.1.5.1 SHORT-CPR PPDU associated parameters

Table 4 *ter* defines the mapping of the SHORT-CPR PPDU associated parameters onto the S-CONNECT parameters.

Table 4 *ter* – Mapping of SHORT-CPR PPDU associated parameters onto S-CONNECT parameters

SHORT-CPR PPDU associated parameter	S-CONNECT parameter	m/nm
Encoding-choice	SS-User-data	m
Reason	SS-User-data	m
User data	SS-User-data	nm
m Mandatory nm Non-mandatory		

7.1.5.2 S-CONNECT Result parameter

This parameter may take the values:

– "reject by SS-provider" (a whole class of values);

– "reject be called SS-user" with SS-user-data.

The former case arises when rejection is initiated by the session-service provider; the Provider reason parameter is absent even though rejection is initiated by the presentation-service-provider. The latter case arises when rejection is initiated by the responding PPM or PS-user. The Provider reason parameter is present only if rejection is initiated by the responding PPM. The User-data parameter of the PPDU may only be present when rejection is initiated by the responding PS-user.

7.1.6 SHORT-CP PPDU

The SHORT-CP PPDU shall be conveyed from the initiating PPM to the responding PPM in the S-CONNECT request and indication primitives to establish the presentation-connection.

7.1.6.1 SHORT-CP PPDU associated parameters

Table 4 *quater* defines the mapping of the SHORT-CP PPDU associated parameters onto the S-CONNECT parameters.

Table 4 *quater* – Mapping of SHORT-CP PPDU associated parameters onto S-CONNECT parameters

SHORT-CP PPDU associated parameter	S-CONNECT parameter	m/nm
Encoding-choice	SS-User-data	m
User data	SS-User-data	nm
m Mandatory nm Non-mandatory		

22) Subclause 8.1.1

Add at the end of the list:

c) the structure of session-service primitives Special User-data parameter values.

Consequently, change the period at the end of item b) to semi-colon.

23) Subclause 8.1.2

Change the first sentence with the addition of the following text:

8.1.2 The structure of SS-user data parameter values except for those in the SHORT-CPA, SHORT-CPR and SHORT-CP PPDUs is specified using:

Add at the end of the list:

d) the specification of the short-encoding PPDUs in 8.2 *bis*.

Consequently, change the period at the end of item c) to semi-colon.

Add at end of 8.1.2 the following sentence:

The structure of the SHORT-CPR, SHORT-CPA and the SHORT-CP PPDUs are specified in 8.1.4, 8.1.5 and 8.1.6 respectively.

24) Subclauses 8.1.4 through 8.1.6

Add the following new subclauses 8.1.4 through 8.1.6, after 8.1.3:

8.1.4 SHORT-CPR PPDU

The protocol control information of the SHORT-CPR PPDU shall be one octet, with the bits 6-4 identifying the Reason parameter and 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-CPR is as shown in the following bit pattern:

0yyy00zz

where yyy identifies the Reason parameter defined as follows:

- 000: presentation-user;
- 001: reason not specified (transient);
- 010: temporary congestion (transient);
- 011: local limit exceeded (transient);
- 100: called presentation-address unknown (permanent);
- 101: protocol version not supported (permanent);
- 110: default context not supported (permanent);
- 111: user data not readable (permanent).

and zz identifies the encoding-choice as follows:

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

The User-data shall be of type null-encoding (see 8.4.4).

8.1.5 SHORT-CPA PPDU

The protocol control information of the SHORT-CPA 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-CPA 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.

The User-data shall be of type null-encoding (see 8.4.4).

8.1.6 SHORT-CP PPDU

The protocol control information of the SHORT-CP 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-CP 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.

The User-data shall be of type null-encoding (see 8.4.4).

25) Subclause 8.2

Add to **CP-type**, *just before* **"user-data"**:

```
protocol-options                [11] Protocol-options DEFAULT {},
                                  -- shall be absent if no options are offered
initiators-nominated-context    [12] Presentation-context-identifier
                        OPTIONAL,
                                  -- shall only be present if nominated-context is
                                  -- offered in protocol-options
extensions                      [14] SEQUENCE { ... } OPTIONAL,
                                  -- to allow for future extensions
```

Add to **CPA-PPDU**, *just before* **"user-data"**:

```
protocol-options                [11] Protocol-options DEFAULT {},
                                  -- shall be absent if no options are selected
responders-nominated-context    [13] Presentation-context-identifier
                        OPTIONAL,
                                  -- shall only be present if nominated-context is
                                  -- selected in protocol-options
```

NOTE – Extension markers are only used in the CP PPDU. Presentation does not have a context-free transfer syntax, and does not identify its own encoding with a transfer syntax name, thus future extensions to PPDUs other than CP can be added using comments, provided these comments link the presence of the extensions to some field in the CP.

Add extensibility markers, " , ... " at the end of **Abort-reason** *and* **Event-identifier** *definitions.*

In the definitions of **Context-list**, **Presentation-context-deletion-list**, **Presentation-context-deletion-result-list**, **Presentation-context-identifier-list** *and* **Result-list** *change* **"SEQUENCE OF"** *to:*

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

Make the definition of **Presentation-context-identifier***:*

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

Add extensibility markers, " , ... " at the end of **Presentation-requirements**, **Protocol-version** *and* **Provider-reason**.

Make the definition of **Presentation-selector***:*

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

Add extensibility markers, " , ... " at the end of **Presentation requirements**.

Add before **Protocol-version***:*

```
Protocol-options      ::= BIT STRING { nominated-context (0),
                                       short-encoding (1),
                                       packed-encoding-rules (2),
                                       ...
                                     }
```

Add extensibility markers, " , ... " at the end of the **CHOICE** *in* **User-data**.

In the definition of **Fully-encoded-data** *change* **"SEQUENCE OF"** *to:*

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

Add, after 8.2, before 8.3:

8.2 *bis* Short-encoding PPDUs

8.2 *bis*.1 If the short-encoding protocol option is selected on the Presentation connection, and the PPM receives a P-DATA request in which the PS-User data value contains a single presentation data value, the PPM may optionally choose to use either the User-data type specified in 8.2, 8.3 and 8.4 or the encoding specified in 8.2 *bis*.2 or 8.2 *bis*.3 (corresponding to a “SHORT DT” PPDU). If the latter is used, a value, as specified in 8.2 *bis*.2 or 8.2 *bis*.3 shall be conveyed in the Special User-data parameter of the S-DATA request.

8.2 *bis*.2 If the presentation data value is from the nominated context, or the DCS contains only one member and the context management functional unit is not selected or the DCS is empty, then:

a) the SS-user data parameter of the S-DATA request shall be the concatenation of the bitstrings resulting from the encoding of the presentation data value forming the PS-User data value according to the appropriate transfer syntax;

b) the Special User-data parameter of the S-DATA request shall be the value 1 (i.e. the bitstring “01”).

8.2 *bis*.3 If the DCS contains more than one element and the presentation data value in the PS-user data value is from a presentation context that is a member of the DCS, has a presentation context identifier that is less than 255, and is not the nominated context, then:

a) the first octet of the SS-User data parameter of the S-DATA request shall be the presentation context identifier encoded as a binary integer;

b) the second and all subsequent octets of the SS-User data parameter of the S-DATA request shall be the concatenation of the bitstrings resulting from the encoding of the presentation data value forming the PS-User data value according to the appropriate transfer syntax;

c) the Special User-data parameter of the S-DATA request shall be the value 2 (i.e. the bitstring "10").

26) Subclause 8.3.1

Change 8.3.1 to:

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

a) if the packed-encoding-rules protocol option is not selected, according to the Basic Encoding Rules for ASN.1 (see ITU-T Rec. X.690 | ISO/IEC 8825-1); or

b) if the packed-encoding-rules protocol option is selected, according to the Packed Encoding Rules for ASN.1 (see ITU-T Rec. X.691 | ISO/IEC 8825-2).

27) Subclause 8.3.3

Add at the beginning of 8.3.3 the following text:

8.3.3 Unless the null-encoding protocol option is selected, 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 CP-type value and the CPC-type values, if any.

28) Subclause 8.4.1.2

Replace the text of this subclause by the following text:

The User-data value shall be of type Simply-encoded-data when the default context is used and the null-encoding protocol option is not selected.

29) Subclause 8.4.1.3

Replace the text of this subclause by the following text:

The User-data value shall be of type Simply-encoded-data when the DCS contains only one member and the context management functional unit is not selected and the null-encoding protocol option is not selected.

Add, before the Note in 8.4.1.3:

8.4.1.3 *bis* The User-data value shall be of type Simply-encoded-data if the nominated-context protocol option has been selected and the presentation-data-values are from the presentation-context nominated by the sender.

30) Subclause 8.4.1.4

Replace item b) by:

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 packed-encoding-rules protocol option is not selected, according to the Basic Encoding Rules for ASN.1 (see ITU-T Rec. X.690 | ISO/IEC 8825-1); or

   ii) if the packed-encoding-rules protocol option is selected, according to the Packed Encoding Rules for ASN.1 (see ITU-T Rec. X.691 | ISO/IEC 8825-2).

31) Subclause 8.4.2.2

Replace a) and b) by:

a) the DCS contains more than one member and the nominated-context protocol option has not been selected; or

b) the context management functional unit has been selected and the nominated-context protocol option has not been selected; or

c) the presentation-data-values are not all from the presentation-context nominated by the sender.

If the nominated context uses a transfer syntax that produces non-self-delimiting values, the sender shall send only one pdv from the nominated context on a single Presentation primitive.

Add at the beginning of 8.4.2.4:

When the packed-encoding-rules protocol option is not selected,

32) Subclause 8.4.2.5

Add at the beginning of this subclause:

When the packed-encoding-rules protocol option is not selected,

Add after this subclause and before 8.4.2.6:

8.4.2.5 *bis* When the packed-encoding-rules protocol option is selected, Full encoding shall be the application of the Packed Encoding Rules for ASN.1 (see 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 8.4.2.5 *ter*.

8.4.2.5 *ter* When the packed-encoding-rules protocol option is selected, the presentation data values component of a PDV-list value shall be encoded according to the Packed Encoding Rules for ASN.1 (see 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 8.4.2.5, 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.

33) Subclauses 8.4.4 through 8.4.4.2

Add the following new subclauses 8.4.4 through 8.4.4.2, after 8.4.3.2:

8.4.4 Null encoding

8.4.4.1 This encoding shall be used when the null-encoding protocol option is selected on the Presentation connection.

8.4.4.2 Null encoding shall be the concatenation of the bit strings.

34) Subclause A.4.1.2

Replace A.4.1.2 as follows:

A.4.1.2 If the incoming event is related to a received PPDU or SS-provider event, the PPM shall issue a P-P-ABORT indication. If there is an underlying session-connection, the PPM shall issue an ARP PPDU if possible, or if the null encoding protocol option has been selected, then issue an S-U-ABORT request primitive with no SS-user-data parameter.

35) Subclause A.5

Add as A.5.1 bis:

A.5.1 *bis* Protocol options

A set of protocol options used in the procedures specified in this annex is defined as:

po-dom = (NC)

where NC is the nominated context protocol option.

A Boolean function PO is defined over po-dom as follows:

for p in po-dom

PO(p) = true if, and only if, the protocol option p has been selected during the presentation-connection establishment phase.

36) Subclause A.5.2

Add to list in A.5.2:

h) the nominated context of this PPM;

i) the presentation context proposed as the nominated context for the initiating PPM;

j) the known nominated context of the peer PPM.

Consequently, change the period at the end of item g) to semi-colon.

37) Subclause A.6

Add the following row to Table A.16 after S-P-Abind*:*

Abbreviated Name	Category	Name and Description
S-U-ABind-nd	SS primitive	S-U-ABORT indication with no SS-user-data parameter

Add the following rows to Table A.17:

Abbreviated name	Name and description
STAI3	await SCA PPDU
STAI4	await P-CONNECT response

Add the following rows to Table A.18:

Abbreviated Name	Category	Name and Description
SCA	PPDU	SHORT CONNECT ACCEPT
SCR	PPDU	SHORT CONNECT REJECT
SCN	PPDU	SHORT CONNECT

Add the following rows to Table A.19:

Code	Action
[24]	If the PPDU contains an Initiator's nominated context parameter, record the presentation context proposed as the nominated context of the initiating PPM.
[25]	If PO(NC) is TRUE and the presentation context proposed for the nominated context of the initiating PPM is a member of the DCS, then record that context as the known nominated context of the peer PPM.
[26]	If PO(NC) is TRUE and the presentation context proposed for the nominated context of the initiating PPM is a member of the DCS, then record that context as the nominated context of this PPM.
[27]	If PO(NC) is TRUE and the PPDU contains a Responder's nominated context parameter, then record that context as the nominated context of this PPM.
[28]	If PO(NC) is TRUE and the PPDU contains a Responder's nominated context parameter, then record that context as the known nominated context of the peer PPM.

Add the following row to Table A.20:

Code	Meaning
p31	Local choice and conditions for choosing the null-encoding and short-connect protocol options as defined in 5.4 *bis* are satisfied.

Replace Table A.21 by:

Table A.21 – Connection establishment

	STAI0 idle no connection	STAI1 await CPA	STAI2 await P-CONrsp after CP received	STAI3 await SCA	STAI4 await P-CONrsp after SCN received
P-CONreq	p02 & p03 & ¬p31 [04][05][02][20] [24] CP STAI1 p31 [03][24] SCN STAI3				
CP	p01 & p02 & p03 & p22 [01][02][20] [24] P-CONind STAI2 ^p01 OR ^p02 OR ^p22 [01] [24] CPR STAI0				
P-CONrsp+			p04 [06] [12] [26][28] CPA STAt0		SCA STAt0
CPA		p04 [03] [12] [25][27] P-CONcnf+ STAt0			
P-CONrsp			p04 [06] CPR STAI0		SCR STAI0
CPR		p04 P-CONcnf STAI0			
S-CONcnf		P-CONcnf STAI0		P-CONcnf STAI0	
SCA				[12] P-CONcnf+ STAt0	
SCN	p01 & p22 P-CONind STAI4 ¬p01 OR ¬p22 ARP STAI0				
SCR				P-CONcnf STAI0	

Add the following bottom row to Table A.23:

S-U-ABind-nd	P-PABind STAI0	P-PABind STAI0	P-PABind STAI0	P-PABind STAI0	P-PABind STAI0	P-PABind STAI0

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